Dun's Review, International Edition

A Journal for the Promotion of International Trade

Published monthly by R. G. DUN & CO., The Mercantile Agency

Established 1841 — 290 BROADWAY, N. Y., U. S. A. — First European Branch Opened 1857

Subscription $3.00 U. S. Gold per year, payable in advance

Entered at the New York Post Office as second class matter

Vol. XXIV. **FEBRUARY, 1915** **No. 6.**

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DUN'S INTERNATIONAL REVIEW

is also published monthly in *SPANISH*, making twenty-four issues in the two languages per year.

The attention of every reader of the paper is particularly directed to the *BUYER'S GUIDE* on pages 3, 4, 6, 8, 10, 12, 13 and 14 and to the *ALPHABETICAL INDEX* of Advertisers on pages 15 and 16. At the present time buyers in every part of the world are no doubt interested in establishing new connections for the purchase of lines cut off by the European war and it is recommended that this Buyer's Guide be retained for reference as it contains a classified list of several hundred articles, together with the names of manufacturers or exporters from whom they may be obtained.

Correspondence regarding any topic of international trade interest is invited from readers of the Review and contributions on such subjects, if available for publication, will be paid for at space rates. Photographs of commercial scenes will be purchased, if suitable for reproduction. Manuscripts and photographs not used will be returned promptly if postage is sent for that purpose.

Contents

FEBRUARY, 1915

THE MOTOR CAR OF 1915 67-70

MOVING THE EARTH 71-74
BY THADDEUS S. DAYTON, OF NEW YORK

THE WIDENING FIELD FOR THE MOTOR CYCLE 75-76

FEEDING 7,000,000 DESTITUTE BELGIANS . . . . . 77-80 and 99-100

SAN FRANCISCO, THE EXPOSITION CITY OF 1915 81-85
BY HERBERT CARL BERSTEN, OF SAN FRANCISCO

THE COMMERCIAL IMPORTANCE OF THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION 86-90
BY A. A. WILLOUGHBY, OF SAN FRANCISCO

DRY GOODS SECTION

AMERICAN GOWNS AND AMERICAN FABRICS 92-93

HAT AND GOWN MUST BE THE SAME STYLE PERIOD 95

1915 STYLES IN MOTOR CLOTHING 97

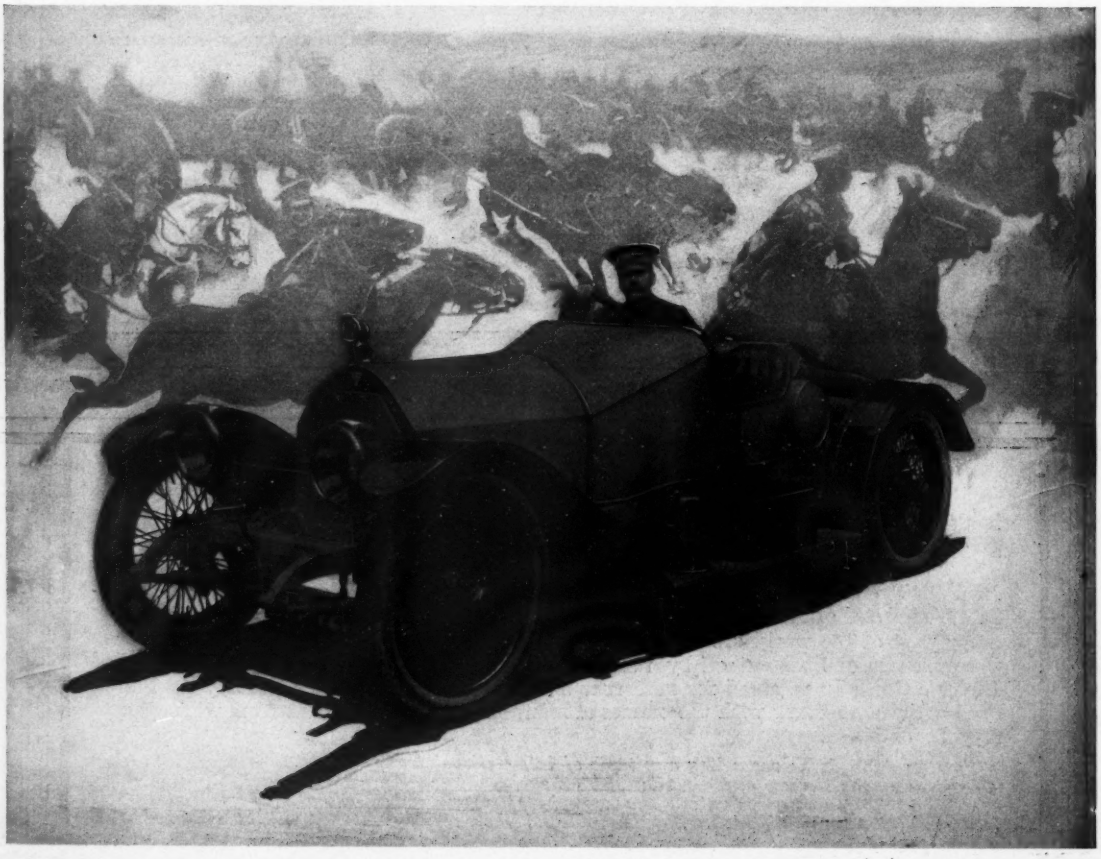
THE WORLD'S MARKET PLACE 101-102

INFORMATION FOR BUYERS 103-104-105-106-107-108-109-110

CLASSIFIED DIRECTORY OF ADVERTISEMENTS—A BUYER'S GUIDE . 3-4-6-8-10-12-13-14

ALPHABETICAL INDEX TO ADVERTISERS 15-16

Captain Alfred Rawlinson, Aide-de-Camp to Sir John French, in a Hudson roadster



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The motor busses in this long line of vehicles were formerly part of the public transportation system of Paris, but now have been commandeered by the French army—the illustration shows them on the way to Compiegne

THE MOTOR CAR OF 1915

Pleasure Car Models Exhibited at the Great Automobile Shows this Year Have Many New Refinements and Mechanical Improvements—Prices Much Lower

THIRTY years have wrought a revolution in warfare. To-day the auto engine is supreme. The horse is no longer a necessity. Motor cars and motorcycles rush along the battle front at hurricane speeds, or to the far-extended rear of the army where slow-moving trains of motor trucks, loaded with food for the men and the cannon, roll ponderously along. Here and there, thrown to and fro like shuttles through the vast web of war, big guns mounted on heavy platforms rumble over broken roads, while the lighter artillery in armored cars, that themselves look like huge projectiles, dash past them. Everywhere the pungent odor of gasoline mingles with that of exploding shells and the other effluvia of war.

War has already taught the American motor car manufacturers many valuable lessons and they have been quick to take advantage of them. They have watched their machines at work abroad, have noted what weaknesses have developed in the course of their incredibly severe usage, and have hastened to remedy them. New ideas, useful in peace, have been born of the necessities of war—such as the practicability of the four-wheel drive and of two reverse drives and double steering, so that it is possible to retreat quickly where the roads will not permit turning around—have been adapted or adopted.

The great war, however, is too recent for its effect to have become apparent in the new 1915 models which are now being exhibited for the first time at the automobile shows. Designers and engineers have been working on these models since the early part of last year and the new devices presented for the inspection of visitors at the great annual shows of New York, Boston, Chicago and other American cities have been subjected to the severest tests for many months.

The trend of the new cars is toward smaller high-speed motors, harmonious lines based on carefully worked out theories of wind-resistance, a wealth of provision for additional comforts, mechanical simplicity that approaches the ideal, and lower prices. Among the chief mechanical characteristics in which the car of 1915 differs from its immediate predecessor are the introduction of the eight-cylinder motor, improvements in matters of ignition, gasoline feed and lighting. In these and many other things the advance is very noticeable.

The automobile situation in the United States presents a

Horse-drawn vehicles are little used nowadays in transporting an army's food supply. In the illustration are seen some of the auto trucks of the Commissariat Division of the British Expeditionary forces in France

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A Belgian mitrailleuse mounted on an armored automobile. The operator sits behind the gun atop of the car

striking contrast to that in the countries at war, which formerly were considerable exporters of motor cars. In Europe the automobile factories find it difficult to secure workmen and to meet the military demands for motor cars. Consequently, there are few new European models this year. The United States last year produced more than 515,000 cars, valued wholesale at over $485,000,000, which considerably exceeded the motor car output of the remainder of the world. A still greater production is expected in 1915.

The unusual value of the American car has become one of its most striking features. Keen competition has brought down the price of cars and has caused manufacturers to add many attractions and details of body equipment that were not thought of a few years ago. Concentrated effort on the part of great engineers and leaders of industry, combined with scientific manufacturing by men schooled in efficiency in every department, and the production of cars on a huge scale have made possible the offering of greater car values for less money than ever before. Every demand on the part of the public, not only in the United States, but in foreign markets, has been met promptly. This has resulted in the increased buying of automobiles and in the growth of American plants, so that among them all they supply a wide range of cars—small or large, low-powered or high-powered, two-passenger or seven, automobiles that are dreams of luxury and models of utility.

With decreasing prices and lessening cost of upkeep the number of persons who can afford cars has grown tremendously. To-day everyone wants an automobile, and the universal demand is being met by the steady downward trend of prices for cars that not only are useful and durable, but also are strikingly beautiful in outline, finish and equipment.

The war has depressed business conditions and has caused financial embarrassment to millions of persons all over the world. Many of them formerly owned motor cars or need new ones. These pecuniary perplexities, in the case of a good many, are likely to continue as long as the war lasts and probably for some time after it is over.

Anyone who has once owned a motor car considers it a necessity rather than a luxury. He is averse to using a horse or a street car or going afoot. Probably such a man will not be in the market for a $7,000 or a $10,000 automobile for many years to come. One of the most important features of the American motor car industry is the large scale of production which enables the manufacturer to offer to the buyer a car at from less than $1,000 to $2,000, or not more than $2,500, that contains all the requirements, accessories and desirable features of the best $5,000 to $7,000 car. Garage owners, automobile agents and dealers, therefore, should be particularly interested in American machines. The man who has owned a $5,000 car will now be inclined to pay especial attention to the automobile at half or a quarter that price that is fully as good in material and workmanship, just as serviceable, comfortable and as handsome in its appearance as the more expensive car. American automobiles, more than any others, combine beauty and attractiveness with durability. They are the products of factories turning out tens of thousands of cars that are giving satisfactory service all around the world, in every climate and under all conditions of use.

The increase in popularity of the medium-priced American car abroad is especially marked in localities which, until a year or two ago, had been supplied almost entirely with cars of foreign manufacture. Although the outbreak of war in Europe has brought this fact into particular prominence by developing the foreign market for the American car even more rapidly, the general excellence of cars made in the United States was generally recognized long before hostilities started. For example, the total car imports of South Africa, from the United States, in 1908, were valued at a little more than $5,000. The following year they were $90,073, and for the four years, 1909-1912, their total value was $1,043,515. In 1913 American cars to the value of $2,623,648 were imported by South Africa, or a little more than 49 per cent. of all the imports of this character.

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Belgian artillery mounted on an armored car in the outskirts of Antwerp. The officer is watching the bombardment of the city

One of the South African motoring papers states that the reason for the amazing growth in the figures of imports from America is to be found, not only in the comparatively low initial cost of the car manufactured in the United States, but in the fact that American manufacturers have borrowed the good points from French and other constructional practice and have added or adapted them to those of their own invention. The result has been a vehicle with a high degree of efficiency which makes a strong appeal to buyers of moderate means.

One of the Belgian armored motor cars showing the vehicle's revolving turret and one of the gunners awaiting orders

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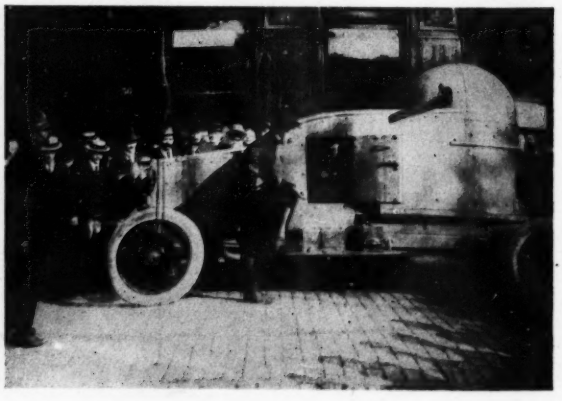
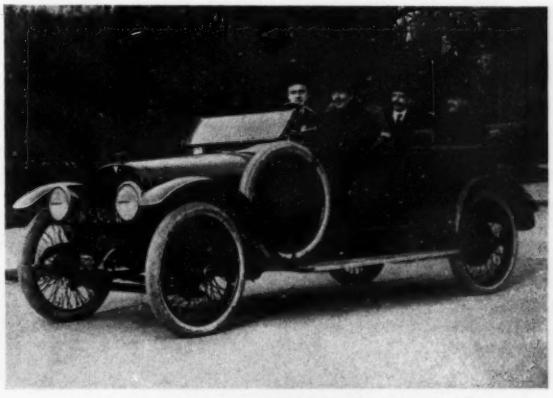


Automobile shows, for the purpose of exhibiting new models, are held each winter in every important American city. One of the most noteworthy of these was in New York City the first week in January—the fifteenth annual National Automobile Show of the National Automobile Chamber of Commerce. There were displays of cars and accessories valued at more than $3,500,000, comprising a total of 336 exhibits. Gasoline pleasure cars were shown by 81 manufacturers, six companies showed electric cars and 13 displayed motorcycles. The remaining 236 exhibitors were makers of accessories. The number of complete cars shown was 528.

An American factory that built and sold 50,000 cars last year and plans to increase its 1915 output to 75,000, produces two-passenger roadsters in two models, two styles of five-passenger touring cars, one four-passenger coupé, and one seven-passenger touring car. In the roadsters the horsepowers are 30 and 35, and the prices to consumers $795 and $1,050, respectively. The five-passenger cars are of the same horsepowers and sell at $850 and $1,075; the coupé is 35 horsepower and its price is $1,600, and the seven-passenger car, a 45-horsepower, six-cylinder, at $1,475.

In these automobiles as well as those of a number of other makes, the manufacturers have vied with each other in producing cars of more graceful and impressive lines than ever have been shown before. There are no sharp angles in the car body. Symmetry and harmony make it exceptionally pleasing to the eye. The long wheelbase gives plenty of room for the occupants, and the spring suspension and well-calculated tire surface make the roughest roads seem smooth. The electric lighting and starting system is only one of many features of equipment that make these moderate-priced cars attractive, and their durability has won them many new buyers through the endorsements of those who already have been purchasers and users.



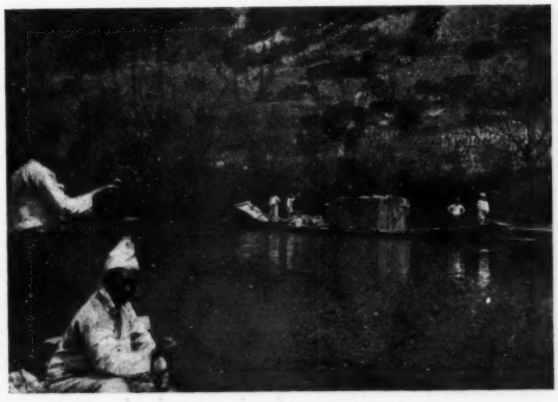
Courtesy Hudson Motor Car Co.

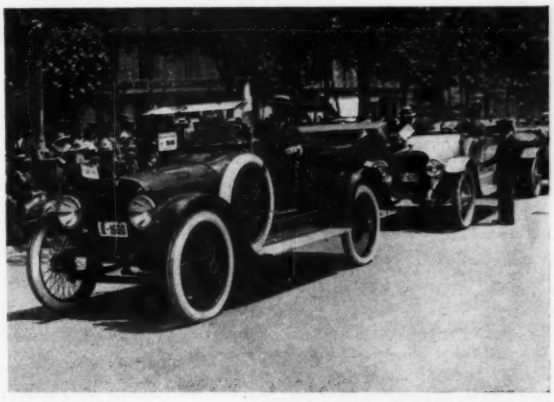
Aviator Pegoud, who became famous by being the first to "loop the loop" in an aeroplane, in his Hudson car in Paris

An interesting development in the export field is an American manufacturer, who was one of the pioneers in the automobile industry, and whose great factory for years has been kept running overtime in order to supply cars for the domestic trade, who is now making his first entry into the domestic field. Such an event affords an exceptional opportunity for agents to get very desirable territory, for

The American car goes everywhere in the world. Here is one being transported up a river in far-off Korea

Courtesy Hudson Motor Car Co.





Courtesy Hudson Motor Car Co.

These were the first light six-cylinder cars, with left side drive and electric starting and lighting, ever seen in Barcelona

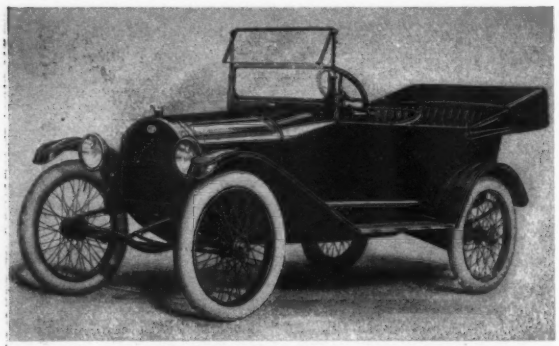
the merits of these cars have long been established among discriminating buyers in the United States.

In the product of this factory there is a light four of a new model that is sold to the consumer at $1,285, and a six for $2,975. The former is a 30-horsepower machine, and the motor is so efficient that it answers every requirement of the tourist, its simplicity, smoothness of operation and power rendering its performance all that the most exacting driver could ask. In beauty of design, handsomeness of finish and completeness of equipment it compares favorably with many cars that are sold at nearly double the price.

Among the new models of another great American factory is a six-cylinder, 40-horsepower machine with a new type motor—small bore and long stroke—which in Europe has made new records for economy. It sells at $1,550 and its improvements are said to represent the work of 48 expert automobile engineers during the year of its evolution. They simplified the starting and lighting system. They simplified the wiring and ran the wires in tubes. They improved the carburetor, added an automatic spark advance and arranged the speedometer so that it is driven from the transmission. In 31 such ways they gave their final touch to the details of the new car, so that it might represent their best ideas in simplicity, refinement and good motor car engineering. It comes in seven models, all six-cylinder, up to 54-horsepower, in phaeton, roadster, convertible roadster, coupé and limousine bodies, at proportionate prices.

The purchase of an automobile, and particularly a touring car, is an investment that pays dividends in enjoyment and health to one's entire family. While this is desirable, no matter what the cost, there are a number of persons who cannot afford to invest even $1,000 in an automobile. To meet the requirements of this class there are several light touring cars in whose purchase and operation there is no hint of extravagance even for those of moderate means. One of these automobiles that will carry four or five persons comfortably is a 25-horsepower machine, with every improvement that has been found practicable, that sells for $600, completely equipped. It fulfills the demand for a thoroughly reliable car that can be bought and operated on an economical basis.

The same company also manufactures a new fore-door model roadster, at $495, equipped complete. The lines of



Courtesy Metz Co.

The Metz "25" touring model, at $600, is a combination of efficiency, fine equipment, beautiful design and attractive price

its design are excellent, it is an easy-riding car, and the quality and workmanship of all its parts have been given particular attention. It has won official endurance and hill-climbing contest, travels 40 to 50 miles an hour, is easy to drive and economical in its consumption of gasoline and oil.

In mechanical refinements another of the new models is noteworthy. Its engine is of the Knight silent type. It is said to be the only one of these sleeve valve engines with thermo-syphon cooling, and the first one in America with cylinder cast en bloc—a form of casting which is being used this season by many designers, both for the Knight and the poppet valve type.

The four-cylinder, five-passenger, 50-horsepower touring car of this company's manufacture, electrically equipped, sells for $2,500. The roadster, mounted on the same chassis, is the same price. Especially close attention has been given to the design of the body, and the result is riding space that is roomy and luxurious.

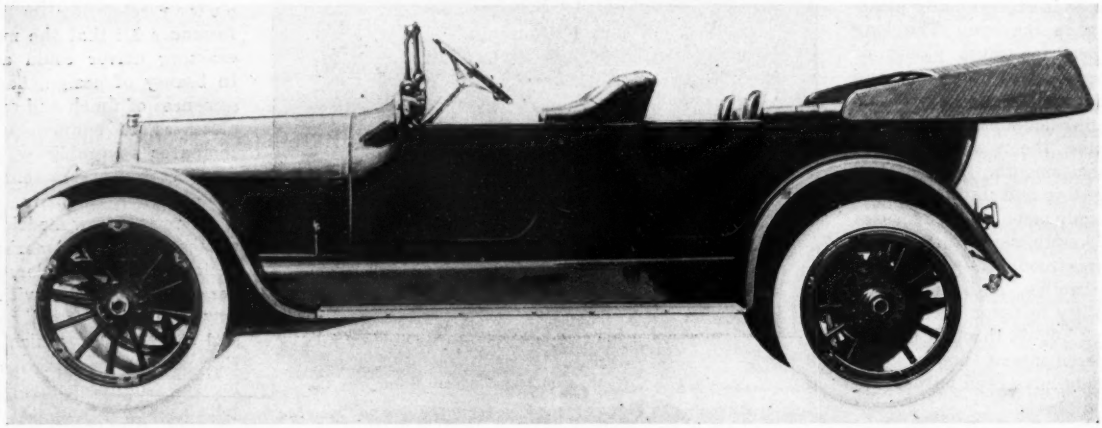
Every motorist enjoys the flexibility, power and luxury of a six-cylinder car, but some have objected to the relative cost of its upkeep. In another of the new American models there is an eight-cylinder car that exceeds the six in flexibility and freedom of vibration, yet which has the same economy of operation, easy turning length and light weight as a moderate-priced four-cylinder car. Its speed can be regulated from a moderate footpace to that of the fleetest of the express trains without touching any other control than the accelerator pedal. Moreover, this eight-cylinder engine is remarkable for its simplicity.

This car is 40-horsepower and sells at $1,350, completely equipped. There is a four-cylinder, also, at $1,165. Large numbers of cars of this make are in use in 22 different countries throughout the world, and give equally excellent satisfaction in the frigid and the tropic zones.

Another interesting eight-cylinder model, whose beauty of line and rich finish are particularly noticeable, is a low-hung car which gives steadiness at high speed and minimizes the tendency to skid on slippery pavements. The control pedals can be adjusted so that a very tall or a very short person can enjoy the greatest comfort. Among the many other improvements, the electric horn button is at the top of the steering post column; changing gears is nearly an effortless operation, the gear shift lever being located so that the hand grasps the ball head almost without bending the body; the speedometer, ammeter, clock, oil signal, electric light push buttons and instrument light are grouped in the center of the instrument board; a slight pressure of the foot on the starting button and the eight-cylinder motor begins to purr—the vibration is so slight that its operation is scarcely noticeable. The manufacturers assert that this car gives a new sensation in motoring—something not found in a "four" or a "six." The price is $1,295.

Another feature of the excellence of the low-priced cars that are among this season's features is a new model that is listed at $740. It is a 25 to 30-horsepower, four-cylinder machine, carrying five passengers. It is said that it will run 20 to 30 miles on a gallon of gasoline, and that its mechanical details tend to reduce oil consumption and upkeep costs to an unusual degree. This car is built by a firm that has had many years' experience.

Seldom has there been such an opportunity for American motor car manufacturers and those agents or dealers abroad who have handled or who are considering taking up their products as this season. Automobiles are higher in quality and lower in price than ever before. In the section entitled "Of Interest to Buyers" will be found detailed descriptions of many of these 1915 models.

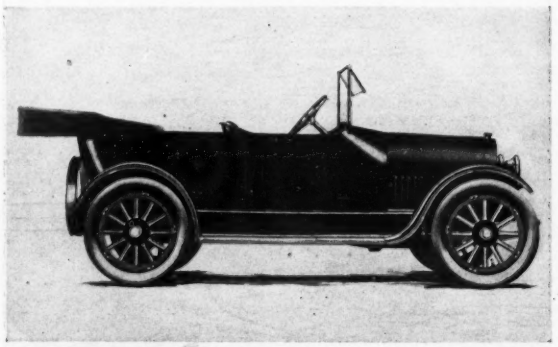


Courtesy The Willys-Overland Co.

This Model 82 Overland, of particularly graceful design, has six cylinders, 45 horsepower, a wheelbase of 125 inches, tires 35x4 1/2 inches, carries seven passengers, and is priced at $1,475, f. o. b. Toledo, Ohio

The new King eight-cylinder car, at $1,350, has the flexibility of a "six" with the economy of operation of a "four"

Courtesy King Motor Car Co.



MOVING THE EARTH

American Steam Shovels, Excavators and Automatic Buckets have Revolutionized this Branch of Engineering Science in the Last Fifty Years

By Thaddeus S. Dayton, New York

MOVING the earth did not become an exact science until the railroad building era dawned, about a century ago. Prior to that time this branch of engineering had stood still for centuries. The only methods of getting through the rock and earth were by picks and shovels, sledge hammers and fire. Rocks too large to be broken by hand were fractured by heating and dashing water over them. To move great masses of stone, armies of men, camels or elephants tugged at ropes. Earth was carried out of cuttings, little by little, in sacks or baskets on the backs of men. It was slow work, but labor was cheap and time was no object.

The biggest engineering task of ancient times, in an earth-moving way, was never completed. One of the kings of Egypt, far back toward the dawn of written history, started to dig a canal between the Red Sea and the Mediterranean, but the work was abandoned after many years of toil and the loss of thousands of lives. The digging and moving of earth by human hands probably reached its maximum in this enterprise. It was not until some thirty centuries later, with the aid of the most improved machinery known in that day, that the Suez Canal finally was constructed. In the next four decades the science of earth-moving made enormous progress. It has reached its meridian of achievement, for the time being, in the Panama Canal.

Courtesy The Hayward Co., N. Y.

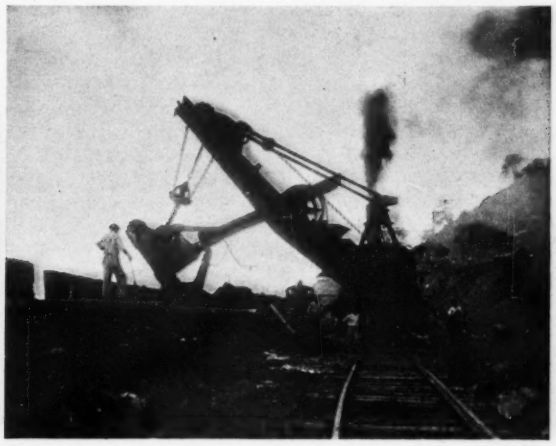
Raising a 40,000-pound rock from a river bed with a 1 1/2 cubic yard orange peel bucket

The business or industry of excavating the earth is one of the mightiest activities of man as well as one of the most ancient. To-day it is a science that either has borrowed from or absorbed many other sciences. It now knows practically no limitations. It concerns itself with everything from the building of a few yards of sidewalk in a city to the construction of a railroad thousands of miles long; from changing the course of rivers to holding back the sea. It has advanced more in the last twenty or thirty years than it did in all the preceding centuries. The world has grown richer and has kept asking for an increasing number of things—better and quicker facilities for travel, bigger buildings with deeper and more solid foundations and for more protection against the elemental forces of Nature. These demands have been world-wide. Therefore, many thousands of men and incredibly efficient machines are kept constantly employed all over the globe where work of this sort is being done. These men are of every class, from the common laborer up to the engineer or executive of such skill and genius that he commands a princely salary.

There is no guesswork to-day about digging into the earth and moving it from where it is not needed to where it is. Each task is more or less of a problem in itself that has to be studied with the utmost care so it can be done by the quickest and most economical methods. Time is now the essence of the contract.

In the matter of machinery inventive science and skillful management have played a great part. Every year some important improvement is made in the rock drill, for instance. One of the latest models is mounted on a car. The drill steel is 30 feet long, which enables a hole of that depth to be drilled without the steel being removed. A jet of water forced into the hole clears

The steam shovel is man's mightiest instrument in his fight against Nature. It is among the greatest labor-savers and wealth-producers that engineering genius has devised. Without it, the excavation of the Culebra Cut at Panama would have been impossible



At Panama fortresses of rock were subjected to a constant bombardment by batteries of power drills

away the powdered rock as fast as the drill progresses. It is said that a drill of this sort will do five times the work of one of the ordinary type. For common use, where the hole for the explosive need not be so deep, many types of drills are employed. Some of them are moved by steam, some by compressed air and some by electricity.

Electricity and compressed air are now much used as the motive power for machinery, their advantage being that in cold weather their power can be transmitted long distances without much loss and without danger of freezing. Steam, however, is still supreme on the great dredges and other types of excavating machinery that are driven by individual plants and not from a central power station.

A few years ago the biggest dump car would not hold more than three cubic yards, and it took two men to empty it. Later its capacity was increased to five cubic yards and then to six, which took still more muscle to dump the material. Now there are cars of thirty cubic yards capacity, or about twelve two-horse wagon loads. One man can dump a train of them. Each car is connected with the locomotive by a long pipe carrying compressed air. This apparatus is more than four times as powerful as the airbrake machinery used on railroad trains, and by its aid a hundred cars can be dumped simultaneously. A hundred men working with shovels could not do as much in a day.

In the matter of steam shovels and dredges similar mechanical wonders have been wrought. There are giant machines of this sort that exercise a tractive pull of more than 300 tons on the huge bucket that lifts the earth and rock. So powerful are these engines that only the hardest granite has to be first loosened by explosives. They bite into solid sandstone or traprock and scoop it up as easily as one would dig out hard cheese with a teaspoon. One of these big steam shovels could lift the heaviest locomotive yet made. They are among the latest examples of man's efforts to construct an almost irresistible mechanical force.

The American steam shovel marks an era in man's conquest of nature. One of the most powerful tools that steam and steel have made possible, it ranks among the greatest labor-savers and wealth-producers that inventive genius has devised for engineering purposes. Excavating machinery of this sort had its origin and has reached its greatest development in the United States, owing largely to the magnitude of the earth-moving tasks that have had to be accomplished there. These devices have added hundreds of millions of dollars to the world's wealth and have done the work of great armies of men. Whether digging the big canal across the Isthmus of Panama, loading ore trains in the iron ranges of the Great Lakes, making paths for railways across mountains, stripping coal veins in Pennsylvania, or scooping up copper in the ancient mines of Spain, the steam shovel and all that is connected with it tells a splendid story of American industrial advance.

The first steam shovel dates back only about fifty years. It was a crude affair, made largely of oak. It was not until early in the '70s that the first shovel was mounted on trucks and placed on a track for railroad use. Less than twenty years ago steam shovels of unusual power and capacity were devised and began to be employed in the iron mines in the Great Lakes region of the United States where the ore is so situated that it can be dug from open

Skid excavators are employed in every variety of work: in the digging of ditches and irrigation canals, and in the rehandling of materials where speed is essential to profit. Owing to the width of the canal shown above, two machines with 90-ft. booms were used

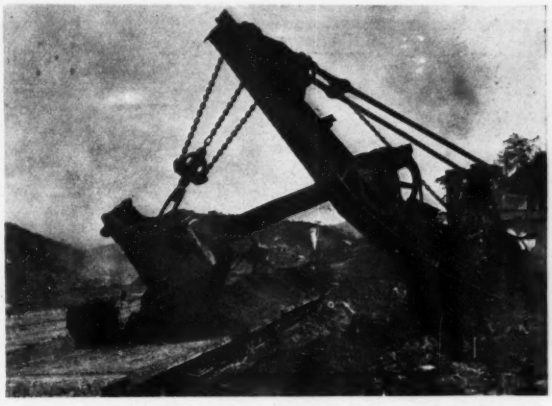
Courtesy The Hayward Co., N. Y.

cuttings. Since then the steam shovel has decreased the cost of that sort of mining by at least 50 per cent. It has been one of the most important factors in the development of the iron and steel industry of the United States by diminishing the cost of production.

Less than ten years ago the American steam shovel was first used in copper mining. In Spain it was employed in the huge Rio Tinto mines that have been worked for nearly three thousand years. There, as in the iron mines of Michigan, the ore is excavated from the surface. The richest deposits of copper were nearest the top of the ground. These were quarried out for centuries by hand labor, and the problem in recent years has been to mine the low-grade copper economically. The solution was found in American steam shovels. Similarly situated copper deposits in Utah, Nevada and Arizona, in the United States—that were of little value without steam shovels—have also been made profitable in the same way.

The mechanical principle of the steam shovel is simple. It is essentially a locomotive crane used for operating a mammoth dipper or bucket. The bucket is made of iron or steel and is carried on a boom so arranged that the bucket can be swung in any desired direction and can be run in or out. Pointed teeth are provided at the cutting edge of the bucket to allow it to dig into hard material and to protect the edge when it is used for handling rock. The capacity of the dipper or bucket is from 1½ to 6 cubic yards. Many of the more than 100 steam shovels that dug the Panama Canal were the largest ever made. A shovel with a scoop of 5 cubic yards capacity can handle from 4,000 to 5,000 cubic yards of rock per day. One of these machines has excavated as much as 32,000 cubic yards of material in 60 hours.

Another type of excavator resembles a dredge, having a series of buckets running on an endless chain. The machine stands on rails at the top of the cutting and the jib holding up the chain is adjusted over the site to be excavated, so that the buckets cut the earth, which they scrape away and deposit in wagons or cars behind the machine. This sort of apparatus is capable of moving more earth in a given time than the ordinary steam shovel, but it is only suitable



One of the big steam shovels used at Panama in the excavation of the famous Culebra Cut

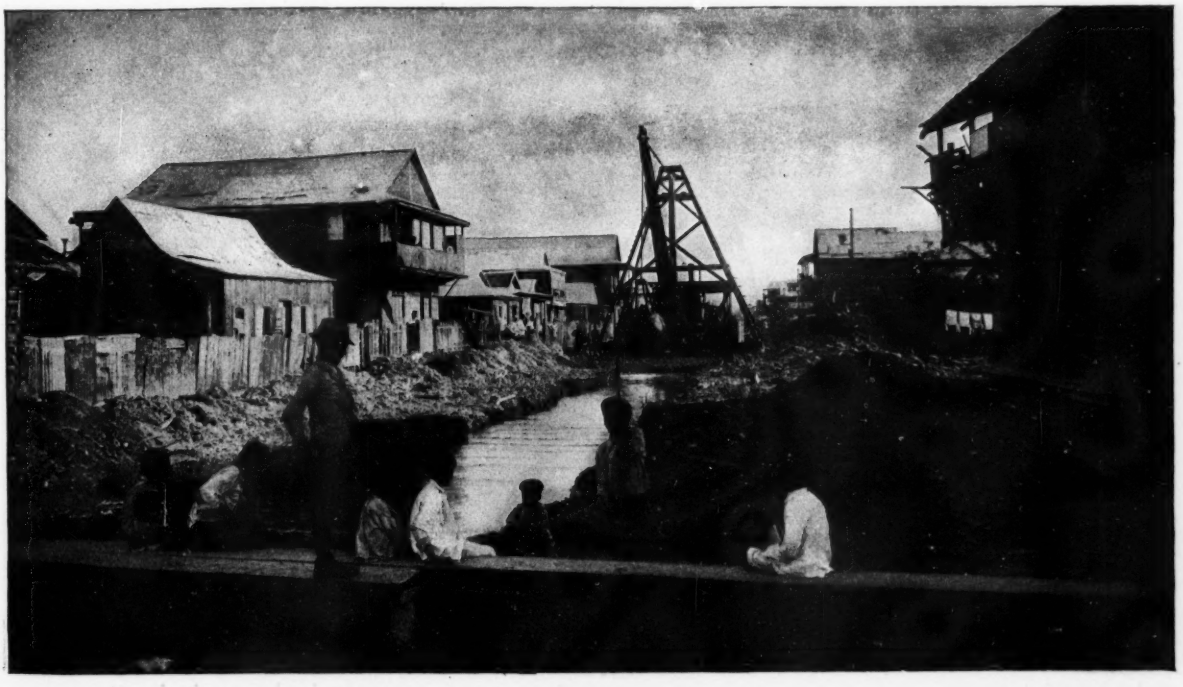
for comparatively shallow cuttings. A similar device is extensively employed in sewer construction, as the excavator can be mounted on rails over the trench to be excavated.

The greatest progress in the development of earth-moving machinery has been in the buckets or dippers. One of the most familiar types of these is the "orange peel." Closed, this bucket is a hollow hemisphere—a steel bowl suspended by chains. To discharge its contents, its four parts, like half an orange peel cut into four sections, open simultaneously. Some of these buckets are only three-sided, but in all of them the bottom part of each section ends in a point that both bites into the material and holds securely what it closes upon. These orange peel buckets are especially well adapted for handling blasted rock and boulders. The three-sided bucket is employed where the boulders, broken rock or other odd-shaped materials are to be dug or shifted.

A striking feat accomplished by one of these buckets of only 1½ cubic yards capacity was the raising of a 40,000-pound rock from the bed of the East River, New York City.

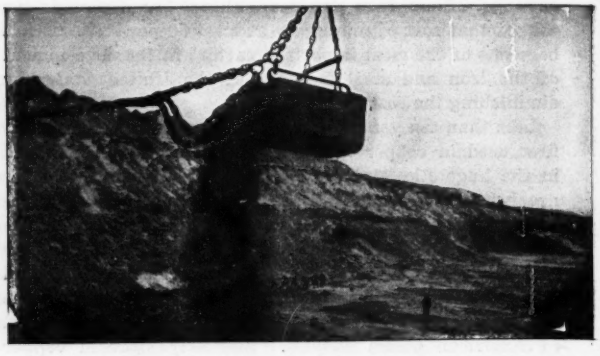
Sewers at Colon were constructed by the United States Government before work was commenced on the Panama Canal. This illustration shows an American excavator, equipped with an orange peel bucket, digging a sewer through a street in this tropical city

Courtesy The Hayward Co., N. Y.



Courtesy The Hayward Co., N. Y.

The open front drag scraper bucket has the advantage of permitting the material to enter freely



Courtesy The Hayward Co., N. Y.

A drag scraper bucket just commencing to dump—it is hanging almost directly under the end of the boom

Orange peel buckets of giant size are often used in underwater work where the difficulties of drilling and blasting make it necessary to remove the rock in as large masses as possible. One of these buckets can grasp and lift a boulder measuring as much as 12 feet across and weighing from 8 to 20 tons. A six-foot man can stand erect within one of the blades of a bucket of this sort. The entire bucket is 16 feet high—three times as tall as an ordinary man. The blades when open measure a 12-foot diameter circle, as large as an ordinary living room, and when closed form an immense bowl, 10 feet in diameter and 5 feet deep. Its power wheel weighs more than a ton. The weight of the entire bucket is about 14 tons. But the most striking and important feature of this huge and incredibly powerful machine is that it may be absolutely controlled by only one man.

The clamshell bucket is another type. It resembles a clamshell less in its shape than in the way it opens and closes its giant jaws. The two parts are open at the top and hinged in the center. The clamshell type of bucket is used for a great variety of purposes. The electrically operated kind may be employed on almost any machine having one or more hoisting drums, as it is only necessary for the operating machine to raise or lower the bucket. The digging and discharging of the load are accomplished by means of a motor and drum located in the head of the bucket itself. In foundries these buckets are used to mix sand and transfer it from one place to another. As the load may be discharged gradually, several flasks may be served with the contents of one bucket. Clamshell buckets of the ordinary type are used for handling all sorts of loose bulk materials. The average range of capacity is from ½ to 3 cubic yards, and in weight from 2,000 to 7,200 pounds. The largest size has a capacity of 10 cubic yards.

Still another type of excavator is the drag scraper bucket, which will dig anything from light loam to soft rock. It can be operated by locomotive cranes, skid excavators and many other types of machines. So powerful is this device that it has been often used on frozen earth that seemed impossible to move without blasting. The cutting teeth on these buckets range from 9 to 18 inches in length and are made of manganese steel. The buckets of this type range in capacity from ¾ to 2½ cubic yards. Their weight depends on the nature of the material to be handled.

Digging canals and building channels through swamp lands offer no great obstacle to American excavating machinery. The apparatus shown below is mounted on a platform and the distribution of its weight over a large area prevents its sinking into the marshy ground

Courtesy The Hayward Co., N. Y.

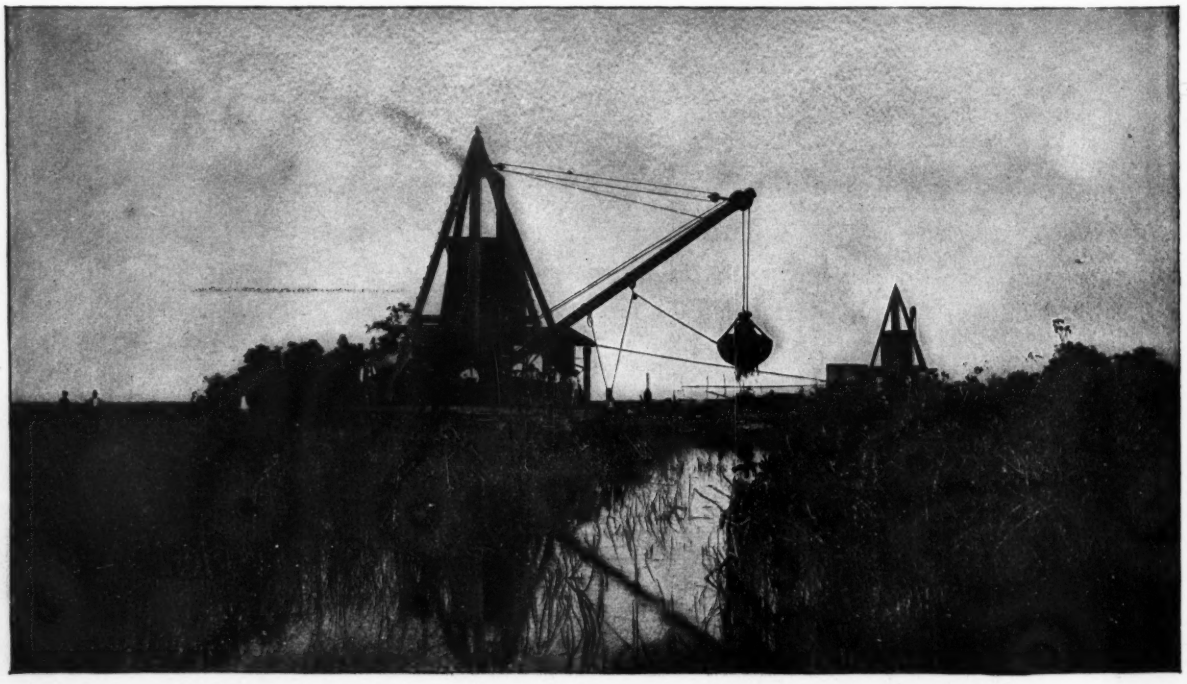


Photo by Edwin Levick

Motorcyclists rally at Wimbledon Common, England, to offer their services to the Government as dispatch riders, etc.

Photo by Edwin Levick

Many motorcycle scouts in the French army are accompanied by dogs which are used to carry messages to headquarters

THE WIDENING FIELD FOR THE MOTOR CYCLE

The Universal Recognition of the Value of the Motor Cycle in Time of War has also Directed Attention to Many New Uses in Time of Peace

THE very extensive use of the motorcycle in the war in Europe has drawn especial attention to its peculiar advantages, under certain conditions, over the horse or the automobile, and is leading to a more rapid widening of its scope of employment for purposes of business and recreation.

The speed possibilities of the motorcycle have caused it to supersede cavalry to some extent for skirmishing and scouting purposes. Formerly, when detachments of cavalry were advanced to feel out the enemy or to discover their position, a detail had to be left with the horses when it became necessary for the rest of the column to dismount and creep forward unobserved. Not only did this weaken the force numerically, but it was difficult to keep the horses in concealment. Nowadays, the motorcyclists drop their machines wherever they choose or else stack them together where they are likely to be safe from discovery. A hundred motorcycles occupy less space than a dozen horses and need no one to hold or guard them.

The individual scout or dispatch carrier is now almost invariably mounted on a motorcycle. In such work speed is the thing, and the motorcyclist races across country or along the footpaths at 40 or 60 miles an hour, a rate of progress that would be impossible on horseback. For this reason the light, footpower bicycle has been almost completely discarded for military use. The tendency of the motorcycle, moving at a rapid rate, is to continue in a straight line and to ignore small obstructions that would deflect the lighter bicycle from its course. This means that the motorcycle can safely traverse rough roads filled with ruts that would throw a bicycle rider.

Persons who never have ridden a motorcycle are often inclined to assume that the speed and power of the average motorcycle render it more dangerous than the bicycle. As a matter of fact, however, a motorcycle traveling at 30 or 40 miles an hour is no more risky to ride than a bicycle at half that speed. The motorcycle is strongly made to withstand the added strain due to the increased weight and speed, and is also provided with increased braking surface and other safety devices to counteract the effect of the added momentum of the heavier machine moving at a more rapid rate. Further, the motorcycle can be started or stopped instantly, and the machine at all times is under perfect control.

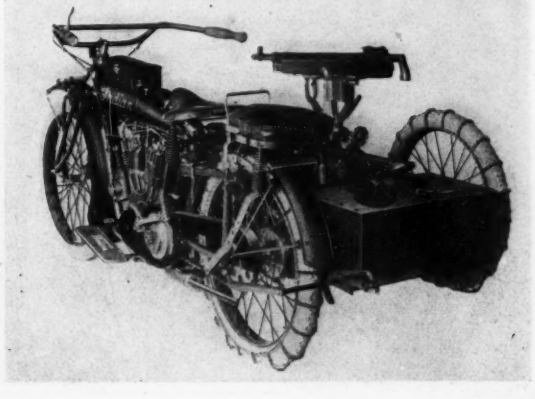
The motorcycle of to-day starts automatically. The rider leisurely climbs aboard and rolls away at increasing speed just as he would in a car. The new motorcycles have three speeds. Horsepowers have been growing without adding materially to the weight of the machine—in some cases the weight has been decreased by 75 pounds or so.

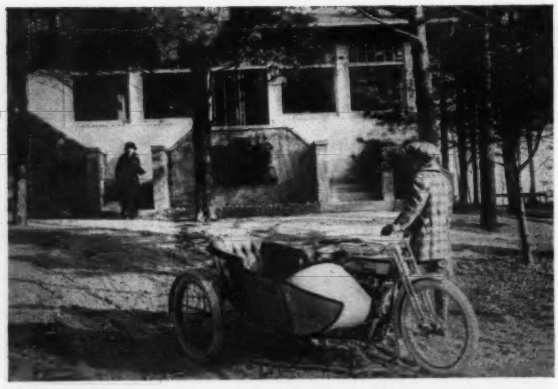
Mail carriers in many of the rural districts of the United States use motorcycles to facilitate their daily work

Courtesy Harley-Davidson Motor Co.

A new model motorcycle equipped with sidecar chassis carrying an automatic field gun firing over 450 shots a minute

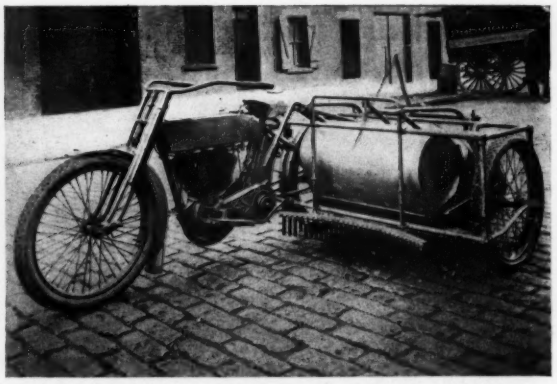
Courtesy The Hendee Mfg. Co.





Courtesy Harley-Davidson Motor Co.

The motorcycle is not a "one-man" affair—with a side-car chassis it has very many social possibilities



Courtesy Harley-Davidson Motor Co.

A new use for the motorcycle—attached to a sweeping machine streets can be cleaned quickly and cheaply

The leading machines now range from 10 horsepower to 15. Magnetos are standard equipment.

In the 1915 models of motorcycles unusual advances in construction and design are particularly notable. For some time there has been a desire among riders for a light weight machine developing 10 horsepower. To meet this demand one of the principal manufacturers has developed a light weight, twin-cylinder machine developing 10 horsepower which is 75 pounds lighter than the regular machine of this type. It is expected that this machine will prove particularly attractive to those who desire a light motorcycle for city use, or who dislike the weight of the high-powered twin-cylinder machines.

The increasing use of the motorcycle for passenger, side-car and commercial work has led to a new departure—the three-speed gear. This permits a wide variation of speed reductions according to the weight of the load carried or the nature of the grades and road surfaces encountered.

In the 15-horsepower twin-cylinder models there is a new heavy duty clutch of the multiple disc type fitted on the countershaft. The large contact area of the friction surfaces makes it ample not only for tandem or side-car work, even on the hardest roads, but for three passengers if necessary.

The new starting device is of the simple but powerful quadrant and pinion type. It is operated by down pressure on the foot lever, and the motor can be started without jacking up the rear wheel.

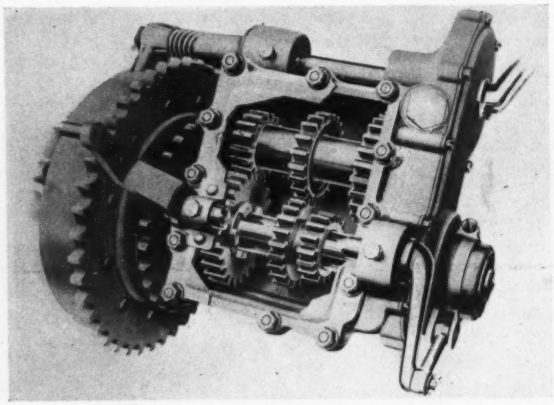
Another of these new three-speed, twin-cylinder, 1915 models still further emphasizes the superiority of this type of machine over the one or two-speed motorcycles. The intermediate gear can be used in rough going, mile after mile, if desired, without noise or overheating the motor, and no racing of the motor occurs at any time or under any road conditions. In low gear this machine will go anywhere—climb a 45 per cent. grade with a side-car and passenger, or alone it will take a 60 per cent. grade.

With this model it is unnecessary to lift the rear end of the motorcycle on to the stand in order to start the motor. The starter turns over the motor enough times so that it starts with a single operation of the device, and it may be operated from either side of the machine by a forward stroke on either pedal.

These are only a few of the important advances made in the construction of these two makes of machines. Each has some two or three-score improvements over its 1914 model—things that make the machines simpler, safer and more durable than any that have preceded them.

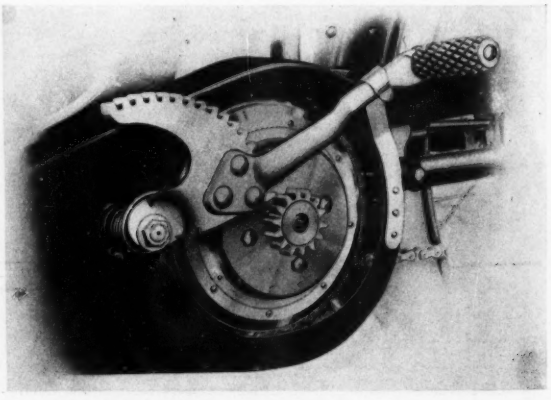
To enumerate and describe the manifold uses to which the motorcycle can be put for business or pleasure would require a large volume. In countries where there is no system of highways for wheeled vehicles, but only trails for horses or mules, the motorcycle is growing rapidly in favor. It can go wherever a horse or a mule can, it can move faster and carry a heavier burden. The motorcycle costs less to buy than the average horse does in the United States, and the expense of its upkeep is trifling.

All these things should be subjects of careful consideration by motor car dealers everywhere. The owning of an automobile does not mean that its purchaser will not buy a motorcycle. As a rule, automobile owners also find the motorcycle as indispensable as a saddle horse used to be. Furthermore, for general utility in regions where the roads are unsuited to four-wheeled cars, the motorcycle is being recognized as a necessity whenever its advantages are pointed out to those who are unfamiliar with them.



Three-speed transmission and clutch unit with transmission cover and clutch operating rod partially cut out showing gears

Courtesy Harley-Davidson Motor Co.



This starter of the simple yet powerful quadrant type is actuated by down pressure on the foot lever engaging the clutch

Courtesy The Hendee Mfg. Co.

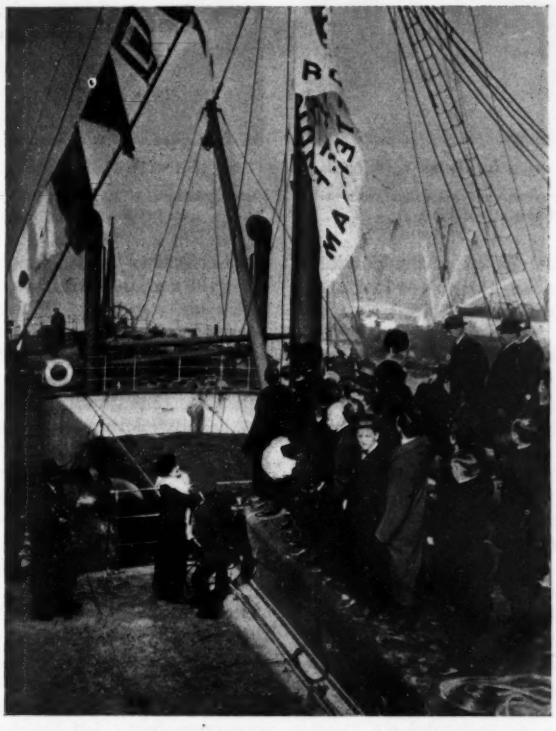
FEEDING 7,000,000 DESTITUTE BELGIANS

The Remarkably Efficient Organization Created to Meet the Most Appalling Situation in the History of the World

By a Correspondent

AT the present time the United States is engaged in an entirely new branch of exportation—a branch in which the value of the commodities shipped abroad amounts to millions of dollars per month—but no drafts are attached to the bills of lading.

It is the biggest commissary undertaking the world ever saw—feeding 7,000,000 people with foodstuffs drawn from collection centers 3,000 to 8,000 miles distant from the centers of distribution. There were 8,000,000 inhabitants in Belgium when the war broke out. Of these probably a million fled across the frontiers into Holland or France, or across the channel to England, or were killed. It is estimated that at the present time the relief commission is feeding about 6,675,000 of the 7,000,000 left in the country. The remaining 325,000 may soon need relief. They are those who had a little money, but that is being rapidly exhausted. The story of how this great relief enterprise came into existence and its present marvelous organization was effected has never been told. When it is told in its completeness it will form one of the most beautiful chapters in the history of the great war. At present the events are too recent for more than the bare outline of a historical sketch.



Mrs. Lindon W. Bates raising the flag of The Commission for Relief in Belgium aboard the S.S. Hannah, at Bush Terminal, New York, January 5th.

As early as the first of October it became evident to Brand Whitlock, the American Minister to Belgium, and other Americans residing at the Belgian capital that unless speedy relief measures were adopted there would be great suffering—if not actual starvation—among the thousands of refugees who had fled from their homes during the months of August and September. Mr. Whitlock and others therefore organized a Brussels Relief Committee and sent Mr. Millard K. Shaler, an American resident of Brussels, to London to purchase provisions. Some 1,500 tons were purchased during the first week of October, but diplomatic difficulties prevented the consignment from being shipped for several weeks. Finally, through the efforts of Ambassador Page at London, Ambassador Gerard at Berlin and the Department of State at Washington, the diplomatic obstacles were cleared away and permission obtained from both the British and German Governments to forward and distribute these sorely needed supplies, provided that the undertaking was carried out under American auspices and control.

Meanwhile, the need had become even more urgent, and. in response to an appeal for help from Minister Whitlock, Ambassador Page and the American residents at London

State after State of the United States has contributed food and clothing by the shipload for the destitute Belgians. The illustration shows the S.S. Hannah, whose cargo was the gift of the State of Kansas, starting for Rotterdam from New York

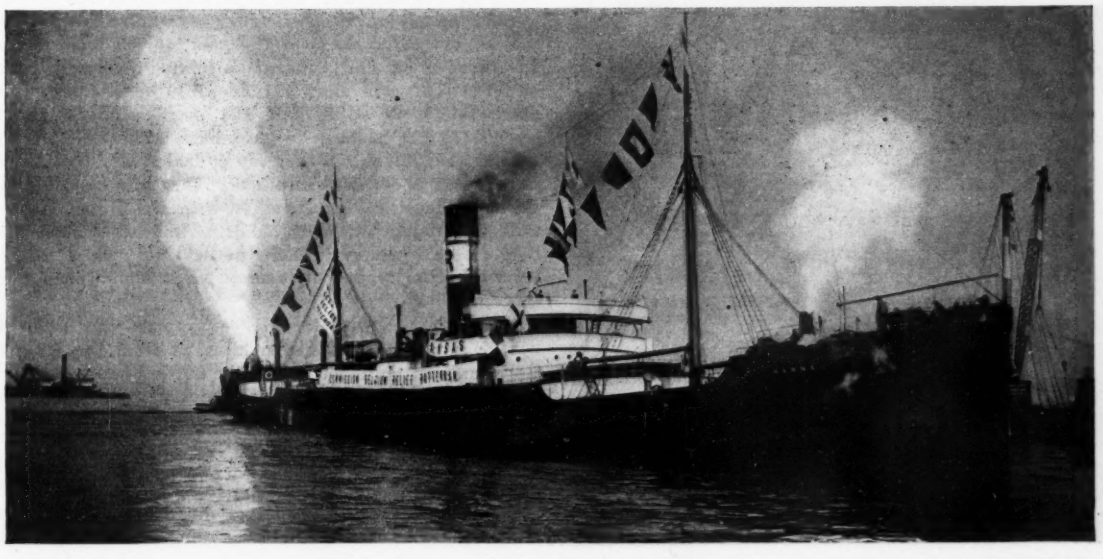


Photo from Commission for Relief in Belgium

Supplies are shipped by rail from the various collection centers to the port from which the ship is to sail

Photo from Commission for Relief in Belgium

Loading the relief ships goes on night and day until their holds are full and the vessels put forth to sea

organized the Commission for the Relief of the Belgians. This body comprised the American, Spanish and Italian Commissions for Relief in Belgium and the Comité National de Secours et d'Alimentation. The honorary chairmen of this Commission were the American and Spanish Ambassadors in London, the American and Spanish Ministers in Brussels, the American Minister in The Hague and the American Ambassador in Berlin. Mr. Herbert Hoover, who had headed the American Relief Committee that had proved so valuable in repatriating American tourists who had been caught in the vortex of the war, was chosen as the chairman of the new organization.

By the end of October the British Government raised the embargo placed by the Board of Trade upon exports of foodstuffs from the United Kingdom in order to permit the *Isis* to sail for Rotterdam with 2,500 tons of provisions for the starving Belgians. This cargo consisted principally of wheat, rice, beans and peas, and four other relief ships were chartered by the London Committee, to be dispatched as rapidly as the cargoes could be collected. The need by this time was very acute, a delegation from Charleroi, headed by the Burgomaster of that city, reporting that out of 600,000 inhabitants within a radius of 15 miles of Charleroi no less than 500,000 were then being fed by organized relief, and that the supplies of food available for further distribution were almost exhausted.

On October 26 Minister Whitlock reported that nearly 7,000,000 of the inhabitants of Belgium were facing famine unless they received help at once. At Brussels 100 soup kitchens were already feeding 100,000 people a day and supplies of coffee, tea, flour, rye and salt were practically exhausted. Reports received by Mr. Whitlock from other cities showed that Louvain had only a four days' supply of flour, while Liège had no flour at all, and a similar situation existed at Namur and Malines. In the country districts conditions were even worse. By October 30 members of the National Relief Committee reported that in Brussels, Charleroi, Liège, Dinant, Namur and Mons, 3,000,000 persons were being fed by charity. Almost simultaneously with the departure of the *Isis* the relief committee at London dispatched the S. S. *Coblenz* with 1,000 tons of foodstuffs.

This flag was especially designed for The Commission for Relief in Belgium, and was first used early in November

Photo from Commission for Relief in Belgium

On October 31 Mr. Hoover sent a stirring appeal to the newspapers of the United States for larger and more systematic help, saying in part: "This is not a question of charity or relief to the chronic poor; it is a question of feeding an entire population. The situation affects the wealthy and well-to-do as well as the poor. It touches every home in Belgium. Our experts calculate that in order to avoid actual starvation Belgium must have every month a minimum of 60,000 tons of wheat, 15,000 tons of rice, 5,000 tons of peas or beans, and a limited amount of bacon or lard. This will allow rations of 10 ounces per capita daily, which is about half the usual soldier's ration. . . . . The problem is immediate. The Belgians are helping themselves, but they can do little. The British and French are under such strain that they also can do little. Besides, these nations, together with the Dutch, have a million refugees on their hands. Americans must feed Belgium this winter. There never was such a call on American charity, and there never was a famine emergency so great."

In conjunction with Mr. Hoover's appeal the American newspapers also published a message from the King of Belgium, written under fire on the battle line in Flanders. "I am informed," wrote His Majesty, "that American officials and citizens in Belgium and England are working to save my people from the horrors of the famine which now threatens them. It is a great comfort to me in this hour of sorrow and misfortune to feel that your great-hearted, disinterested people is directing its efforts to relieving the distress of the unoffending civilian population

Photo by Edwin Levick

Many thousands of pairs of shoes are sorted and classified in the Commission's workrooms near the steamship docks

Photo by Edwin Levick

Inspecting and packing men's and women's clothing in the Commission's warehouse at New York City

of my country. . . . . I confidently hope that the appeal of the American Commission will meet with a generous response. The whole-hearted friendship of America shown my people at this time always will be a precious memory."

The first response to these appeals was the announcement on November 2 by the Rockefeller Foundation that, pending the organization of a systematic campaign, the Foundation had chartered the S. S. *Massapequa* which would leave New York a day or two later, bound for Rotterdam with a cargo of 3,533 tons of foodstuffs, comprising 28,500 barrels of flour, 14,000 packets (100 pounds each) of rice, 3,000 bags (200 pounds each) of beans and 1,000 boxes (100 pounds each) of bacon. The Foundation also announced its intention of co-operating with the various relief commissions with a view to providing for the needs of the suffering people of Belgium at the earliest possible moment, and that it would send a commission of its own to study the situation and report what further action might be necessary. This Commission sailed for Europe November 11 and reported that the organization of the Commission for Relief in Belgium at London, Rotterdam and Brussels was very active and efficient. The Commission also inspected the distributing agencies in Belgium, to which it gave the highest praise. The Rockefeller Foundation, in addition to purchasing the cargo for the *Massapequa*, purchased the entire cargo for the *Neches*, which sailed December 12, and a cargo of wheat for the *Ferrona*, which sailed from Philadelphia December 23, and has thus far spent over $1,000,000 on ships and cargoes for Belgian relief.

Long before Mr. Hoover's appeal was sent to America various movements to raise funds for the non-combatants of Belgium rendered destitute by the war had been organized in different parts of the United States. Of these, the first in the field and the most important was the Belgian Relief Fund, of which the Rev. J. F. Stillemans is president. During the first weeks of the war the contributions to the fund collected by this organization for the non-combatants in Belgium were comparatively small, but as the knowledge of the dire situation in which the people of that country had been placed by the rapid sweep of battling armies across their territory became more general the fund swelled rapidly and by the end of December amounted to over three-quarters of a million dollars. Of this sum $25,000 was cabled to the American Minister to Holland, Dr. Henry Van Dyke, for the relief of Belgian fugitives in that country and $50,000 to Ambassador Page at London. The latter sum, however, had to be returned as it was impossible to purchase further supplies of foodstuffs in England for export, and, in fact, the American Commission at London had been obliged to agree that all foodstuffs exported on its relief ships to Belgium should be replaced by similar quantities of foodstuffs from the United States. The *Massapequa* had hardly started on her errand of mercy before representatives of the Belgian Relief Fund were in the market for another cargo of foodstuffs costing $300,000.

The first great crisis in the relief of the Belgians occurred early in November, when, as already stated, the available local supplies of food were well-nigh exhausted. According to Mr. Shaler, of the Brussels Central Committee, the news that 10,000 tons of cereals purchased by the American Commission for the immediate relief of the situation were on the way from London and Rotterdam, gave new courage to the people, who in many sections had already begun to despair. With the arrival at Brussels of Captain T. F. Lucey, the Commission's Rotterdam representative, the news that the first foodship had already arrived at Rotterdam and that supplies had been loaded into small steamers and lighters and were then on their way to Brussels spread quickly among the people of the city and the neighboring districts. "If those who are giving so generously in America," wrote Mr. Shaler, "could have shared the joy

A bit of the interior of one of the great piers from which the steamers are loaded, showing relief stores ready to go aboard

Photo by Edwin Levick

Photo by Edwin Levick

Office of Lindon W. Bates, Vice-Chairman of The Commission for Relief in Belgium. The blackboard shows the inbound, loading and outbound ships. Their progress is checked on the world map below

of Brussels when it heard this news they would have been more than repaid for the many sacrifices which generosity on such a scale must entail."

The first American relief steamer reached Rotterdam at 3 o'clock on a Sunday morning, but the Dutch Government made an exception to the rigid rule against working on Sunday, and the labor unions permitted their members to work both day and night so that the entire cargo of the ship was on its way to Belgium within 24 hours. A special safe conduct was furnished by Gen. von der Goltz, the Military Governor of Belgium, for the crews of the barges and tugs and the little flotilla met with no delay as it threaded its way from canal to canal and from lock to lock, until on the following Wednesday it arrived safely at Brussels. The sealed hatches of the barges were never opened or touched all the way to Antwerp, Malines and Brussels.

On November 6, the Dutch steamer *Jan Block* sailed from London with 2,000 tons of foodstuffs and a day or so later the Dutch steamer *Tellus* sailed with 1,700 tons. Pending the arrival of the relief ships already on the way or under charter soon to sail from America these supplies enabled the Central Committee at Brussels to get the situation well in hand. Under the personal supervision of Minister Whitlock and His Excellency le Marquis de Villalobar, the Spanish Minister in Brussels, the Central Committee formulated and put into immediate operation very complete plans for receiving and distributing supplies throughout all Belgium. The country was divided into provinces, each of which looked after its own distribution, being represented by two members of the Central Committee. Sub-committees in turn arranged to distribute food supplies to the various communes, these sub-committees usually consisting of members of the town councils. The entire organization, therefore, had an official standing, both with the Germans and among the Belgians themselves. The local grocery stores were in many cases taken over as food centers, thus greatly facilitating the work of actual distribution.

The present population of Brussels is estimated at about 400,000. Of these 225,000 were in the bread lines by the end of November, while those who could still afford to buy bread obtained their supplies from the bakers who sold at fixed prices. Even this wheat, however, had to be obtained from the Commission, and the money thus realized was returned for the purchase of additional supplies. It is probable that at present almost the entire population of Brussels is in the bread line. That of Louvain, Charleroi and Liège has been for some time. In those cities the Commission has had no call for wheat to be sold to the bakers.

In an emergency like this it is deemed advisable to have the Commission's distributing agencies cook the food rather than risk having any of it wasted. Bread is baked in bakeshops under the control of each municipality. The remaining food supplies are made into soup. A ration consists of ten ounces of bread and a half litre of soup per day per person, together with a little coffee and salt. Those who can afford it are charged four cents per day. Others are supplied gratis, but all such cases are investigated and food tickets issued to the head of each household indicating the number and class of rations to which the holder is entitled. These tickets must be presented at the food canteen and duly punched or marked. In order to insure that children are properly fed, five kinds of tickets are issued to the mothers, calling for different types of rations. Milk is such a luxury that to prevent any of it going astray the babies are brought to the food stations and fed there. Nurses take care of the sick children and carry their rations to them. Early in December it was reported that there were 14 communal kitchens and 137 canteens for adults at Brussels, and 16 kitchens and 34 canteens for children under three years of age. Brussels consumes about 3,000 sacks of flour per day. When the first relief barges reached the city there were just 921 sacks left. At present the Commission endeavors to keep a supply of about 15,000 sacks on hand, or enough to last five days; and have from two to three days' supplies at Liège, Louvain, Charleroi and other centers.

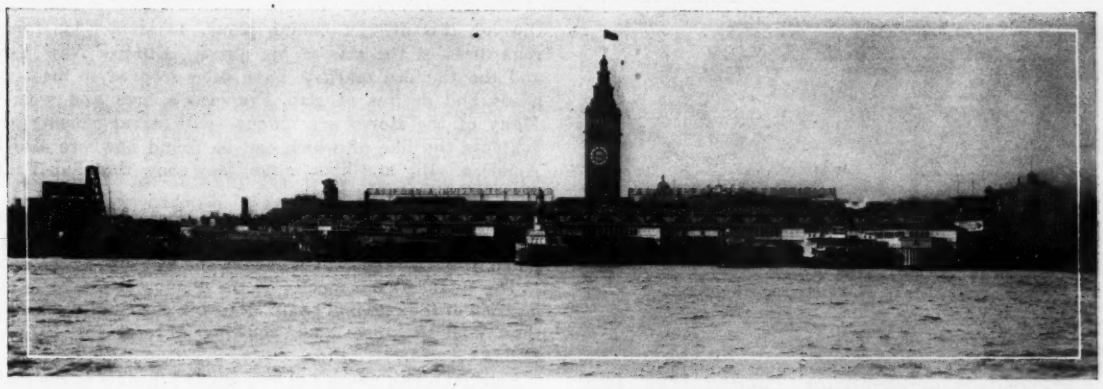
Early in December the shipping agent at Rotterdam received a hurry call from Liège and Antwerp at the same time. The Commission borrowed 10,000 tons of wheat from the Dutch Government to meet this emergency. This loan has since been repaid. The Germans in the same way loaned the Commission food for the Province of Limbourg, which was paid back out of the next consignment. Very little food has been sent into the Province of West Flanders, where the fighting is now going on. Only 101 tons have been sent into that district thus far, but there are probably more refugees from that part of Belgium than from any other.

The distributing system from Rotterdam is very interesting. It had to be organized hastily—in less than a week's time. All food supplies are carried by barges which go from Rotterdam to Belgium by two canal routes. At certain points there are control stations and every boat is numbered and kept track of straight through to Brussels. If barge 26, for example, is reported as passing control station 46 at a certain time and does not reach station 47 after a reasonable interval some one has to go from the border in an automobile and find out what is the matter. From the moment a ship reaches Rotterdam every pound of food is checked and accounted for until it is consumed. From Brussels the supplies are conveyed by canal all over Belgium, with the exception of some small districts of hilly

(Continued on page 99)

The Commission's Traffic Department, at New York City, is one of the nerve centers of the organization. A large staff of experts work night and day handling thousands of bills of lading and keeping track of shipments of all kinds

Photo by Edwin Levick



Ferry Building, San Francisco, from the bay—"California Invites the World—Panama-Pacific Exposition" is the electric sign on top of the long roof

SAN FRANCISCO, THE EXPOSITION CITY OF 1915

Some Interesting Facts about the Famous California Metropolis that is to be the World's Host this Year

By Herbert Carl Bernsten, of San Francisco

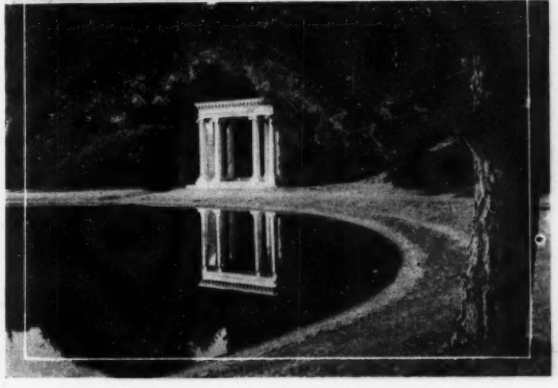
SAN FRANCISCO, truly a "city loved around the world," derives its charm from many sources. Its climate—making possible the flower stands the year around at street corners, Tetrazzini and McCormack concerts to tens of thousands in open air on Christmas Eve, tennis and golf for twelve months in Golden Gate Park—its hills, its wonderful bay, its parks and the grand Pacific, all give the city the zest of the unusual.

Another element that makes San Francisco remembered is its people. Metropolitan and cosmopolitan—there is something more—much that is left of the breadth and depth of the pioneer who crossed the plains in his wagon, blazing trails, enduring hardships, that San Francisco might, as Whitman phrases it, "Look off the shore of my Western Sea, the circle almost circled." That is the spirit that has kept the city prominently in the world's eye by many spectacular achievements; that is the spirit that viewed the smoldering ruin-strewed remains on April 19, 1906, and vowed that the world should see a San Francisco greater, better, bigger and finer than the old. And now, on February 20, 1915, the gates of welcome are to be swung wide — "California Invites the World to the Exposition City" has been announced around the globe and the celebration of the completion of the Panama Canal and the rebuilding of the city of the Golden Gate is about to commence.

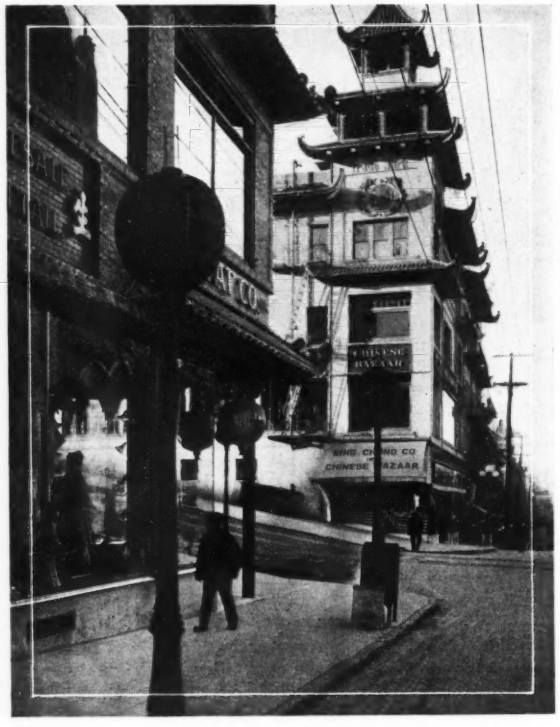
To the tourist much is offered. Crossing the bay to enter San Francisco, the blue sky, the bluer waters and the encircling slopes—all remind one of Italy and the Mediterranean. And the city, piled impressively on its hills, suggests both the Orient and the Occident. From Chinatown to "Little Italy" is but a few short blocks; a few more steps takes the visitor back to the bright lights of the cafés and the advantages of metropolitanism.

The theatres, cafés and hotels of San Francisco are unsurpassed. Famed for his love of good living, the San Franciscan gathers almost all of his luxuries and necessities from his own dooryard. From the wonderful sun-kissed hills come the wines, the fruits and vegetables known the world over. The sea offers delicacies in fish, both of the shell-encrusted and finned variety, while the mountain streams send the trout and the striped bass. Game birds of many kinds fill the list and the mysteries of ravioli, tagliereni and chop suey may be essayed. Epicures can find their hearts' delight either in the efforts of the famous chefs of the big hotels or in the quaint and novel French, Italian, Chinese, Japanese, Spanish or Mexican cafés and restaurants.

Two views in Golden Gate Park—above, the music stand; below, "The Portals of the Past," the marble entrance to a famous Nob Hill residence destroyed in the great fire. These columns were uninjured and were donated to the city by the owners



The theatres offer the best and run the entire year, showing many splendid attractions when the eastern houses are closed. A large shopping district temptingly displays articles of every kind. In Chinese and Japanese stores almond-eyed Celestials show jades and tokens of the Orient with a quantity of "pidgin-English" thrown in for good measure. The American establishments rival the shops of Fifth Avenue and



Grant Avenue, showing a picturesque corner of San Francisco's famous Chinatown with its displays of Oriental wares

Broadway in the extent and selection of their stocks. Paris gowns and hats, wonderful furs, jewelry, footwear —all plead for special attention. The traveler can roam through this district finding plenty to attract his fancy, regardless of the size of his purse. Europe, New York and the Eastern markets have been scoured to meet the needs and desires of San Francisco's men and women. Many of the stores are unique—with arrangements and contents the like of which can be found nowhere else in America. Big and little, alike, they show that San Francisco must have the best.

Pre-eminently a commercial city, San Francisco offers to the business man every facility and comfort in the dispatch of his errand, which adds to the pleasure of the visit.

The financial metropolis of the Pacific Coast, it is the location of the regional bank. Its bank clearings have more than doubled since 1900, showing a total for 1913 of $2,624,428,824.74.

Palatial ocean liners run on regular schedule to the main ports of the world and the increase in ocean traffic through the Panama Canal will add many others to the list.

Five transcontinental railroads, in addition to three shorter lines, connect San Francisco with all parts of the country, assuring speedy travel to any destination.

The geographical position of San Francisco as the gateway to the Pacific and its immense landlocked harbor (the second largest in the world, being exceeded only by that of Rio de Janeiro, Brazil) insures its supremacy as the shipping center of the Pacific Coast, and its position as a foreign and domestic market will be greatly enhanced by the added volume of the trade through the Panama Canal.

San Francisco harbor is large enough to shelter the entire navies of the world, with an area of 450 square miles. Its shore line is 231 miles. Typhoons and hurricanes are unknown, and the greatest Pacific liners dock without difficulty in any weather and at all stages of the tide. By the time of the opening of the Exposition, extensions and improvements giving San Francisco a wharfage line of 44.5 miles long, not including Channel Creek and the three basins, will have been completed. Five new concrete docks

Market Street from Eddy Street, showing the handsome and imposing architecture of the downtown business section as it was rebuilt after the earthquake and fire of 1906

were added in 1913 and twelve others are under way. When all are completed the berthing space will be about 70,000 lineal feet. San Francisco has two graving docks and four floating docks. One of the graving docks is 750 feet long and 82 feet wide. A belt road connecting the piers with the transcontinental railway lines furnishes ideal facilities for handling the commerce of the port and present plans provide for its extension.

As a seaport San Francisco is the commercial outlet of a region that has the greatest variety of natural resources of any part of the earth. It was faith in this great economic fact, that after the catastrophe in 1906 aided and inspired the energies which have made a new city that is the wonder of the world.

In 1913 the exports from San Francisco amounted to $69,670,853, an increase of 27 per cent. over 1912, and this total will be much greater for 1914, for, in spite of the almost total stoppage of shipments to certain countries because of the European war, the loss has been more than made up by the opening of new markets and the increased demand in others. In canned fruits and dried fruits, shipments to Europe have increased greatly and much more is looked for in these lines as well as in fresh fruits. San Francisco has gradually been getting a foothold in Cuba, Jamaica and other West Indian ports, and now, with a direct line via the Canal soon to be established, should receive quite a share of the trade. Into the West Coast of South America are being introduced machinery, iron manufactures, electric appliances, oil and clothing, while lumber has always been imported from here. Into the Orient are being shipped machinery, electrical appliances, cotton manufactures and foodstuffs. California fresh apples are being exported to Australia, one of the largest apple producing countries, as well as dried fruits and manufactures of many kinds. Notwithstanding the handicap of shipping to India at present by having no direct service, San Francisco is rapidly securing a share of the trade and the entering wedge is widening. While the amount is not yet a large share of India's imports, still it is encouraging to note that it is over 250 per cent. larger than the amount

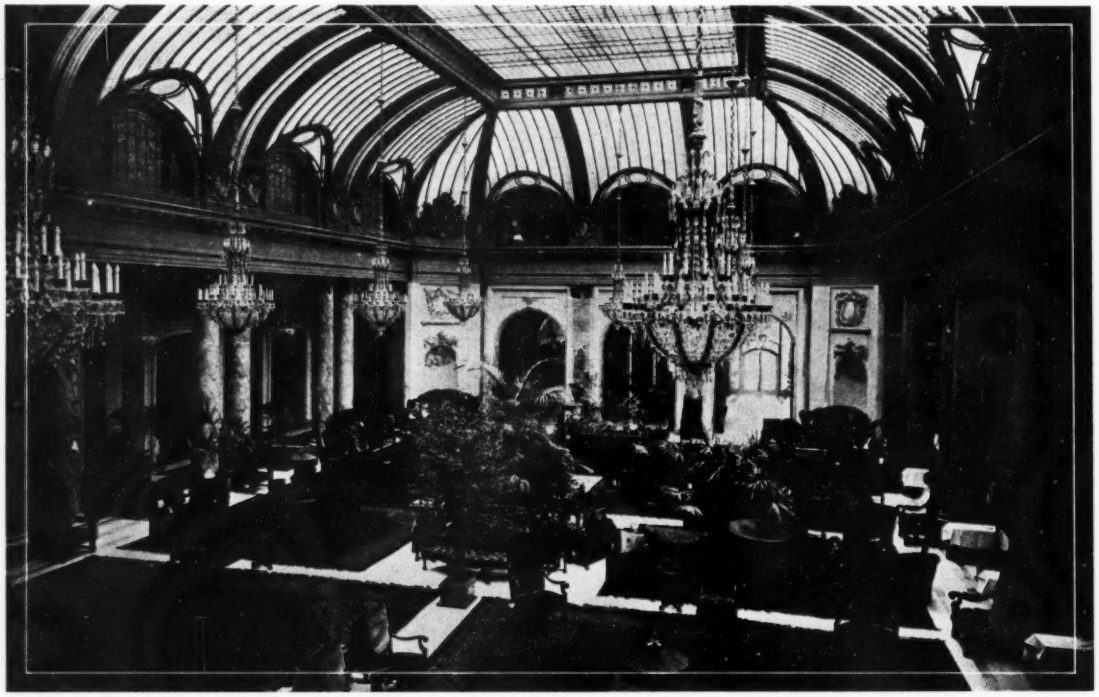
Royal Insurance Building, at the corner of Sansome and Pine Streets, where the San Francisco office of R. G. DUN & CO. is located

The world-famous Cliff House overlooking San Francisco Bay, and a part of the broad beach with its exhilarating surf that forms one of the pleasure resorts of the city

Fairmount Hotel, which commands one of the most beautiful marine views in the world, and contains 520 guest rooms

accommodations for over 250,000 guests at any one time. In process of construction there are over 50 hotels and apartment houses that will be completed by the opening of the Exposition, giving nearly 3,000 rooms more, and in addition there are hundreds of rooms obtainable in private residences and apartments.

Some of the principal hotels of the city are already famous in every corner of the earth. The old Palace Hotel was opened in August, 1875, and became known to every traveler who entered San Francisco, and when on December 16, 1909, the new $9,000,000 hostelry was completed and opened on the same site as the old, it was predestined to be as great as its namesake. The Palace is one of the largest hotels in the world. It occupies an entire city block in the heart of San Francisco's commercial and financial district. Its Market Street frontage is 275 feet, while it extends over 350 feet along New Montgomery and Annie Streets. On the ground floor the whole of the enormous space of some 95,000 square feet is devoted to the offices, dining rooms, ball and banquet rooms, the great "Sun Court" and numerous kitchens. The building is of cream Milwaukee brick,



The great central "Sun Court" around which the Palace Hotel is built—this court is 100 feet wide by 150 feet long

shipped during 1912, and with direct service through the Canal, and the many inquiries received and the interest taken by Indian importers, this should become a very valuable traffic. French Oceania, comprising a few islands in the Pacific, is very near the million dollar mark and undoubtedly a large trade can be developed in the Society, Fiji, Samoan, Mariana and other Pacific Ocean groups when adequate service is put on.

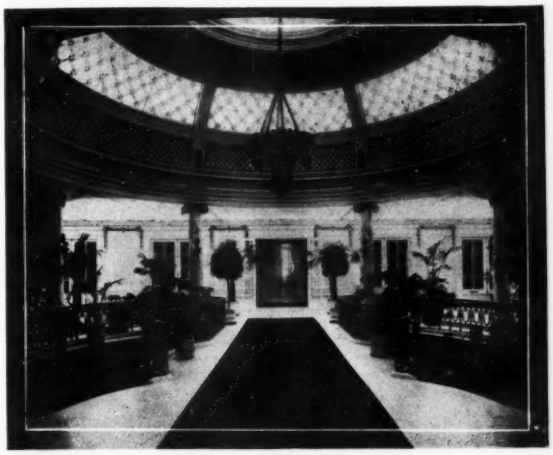
San Francisco, always famous for its hostelries, is now credited with being one of the greatest hotel cities in the world. The disaster of 1906 marked the beginning of a new era and made it possible to modernize a city which then represented sixty-one years of growth. Already what was at the time regarded as an overwhelming calamity has brought its benefits, and the visitor to San Francisco now finds that 98 per cent. of its hotels and apartment houses have been built within the last seven years and are all modern and up-to-date. By official tabulation there are 1,106 hotels and rooming houses, which, with the 880 apartment houses, represent a total of over 116,617 rooms with

Hotel St. Francis. With 1,000 guest rooms this is the largest hotel in the United States west of Chicago

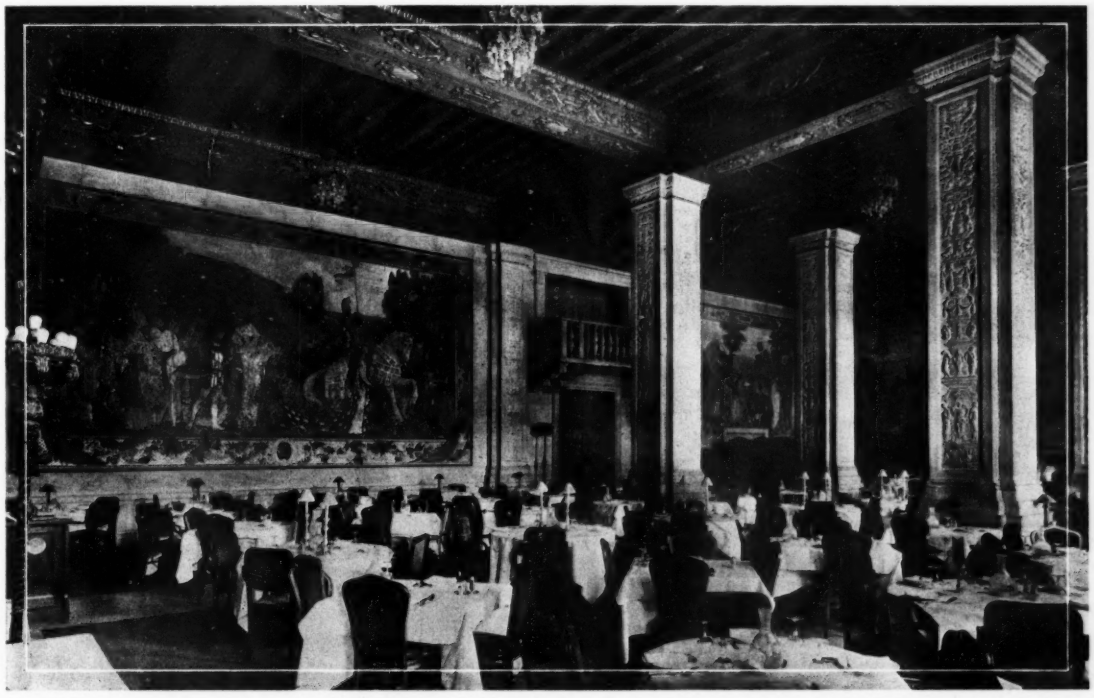
faced on the two lower floors and trimmed with white granite on all floors. The steel frame consists of the heaviest girders and beams used in any construction on the coast, and is designed to carry four additional floors with perfect safety. Every material used in its construction was put together with the idea of its withstanding any action of fire or the elements.

Generally speaking, the plan of the Palace consists of a great central "Sun Court" or lounge, around which the rest of the house is built. This court is 100 feet wide by 150 feet long and from its marble floor to its arching dome is 100 feet high. The court is flanked by a double row of massive Italian marble columns and is furnished with heavy and comfortable chairs, divans and lounges and the floor is covered with heavy rugs.

The Fairmont Hotel is also under the control of the Palace Hotel Company. This building is situated on a magnificent site, with one of the most beautiful marine views in the world. While this is more of a family hotel, most of its guests being permanent residents, it is one of the features of San Francisco's hotel and social life, and represents an investment of about $4,000,000. It contains 520 guest rooms and the Palace Hotel 687 rooms.



The homelike and attractive lobby entrance to the Fairmount Hotel, most of whose guests are permanent residents



The Palace Hotel (shown below) occupies an entire city block, 275 by 350 feet and has 687 guest rooms

The beautiful cafe in the St. Francis Hotel, showing some of its famous mural frescoes and fine beamed ceiling

Another hotel, not so well known, perhaps, as the old Palace, but one that represents every luxury and distinction possible in hostelries is the St. Francis. This, as it stands to-day just after a completion of its newest wing, is the largest hotel in western America. It contains 1,000 guest rooms adapted in size and arrangement to all the possible needs of a great modern hotel. The immense ballroom, in its splendors of gold and rose, would eclipse the most gorgeous palace of the Medicis. The great panels are hung with silken tapestries, in Watteau style, by a famous New York mural decorator who also painted the mural frescoes in the new St. Francis café, which were widely reproduced and commented upon by American art journals.

These are only the three largest hotels, but no Exposition City was ever so thoroughly equipped in the matter of accommodating the masses as is San Francisco. In short, San Francisco is ready and every reader of the Review is cordially invited to view the most wonderful exposition of the progress of mankind ever held.

The main portal of the Palace of Varied Industries is copied from the Hospice of Santa Cruz, Toledo, Spain

THE COMMERCIAL IMPORTANCE TERNATIONAL

Through this Latest of World's Fairs Eastern while the West will Show its Products and

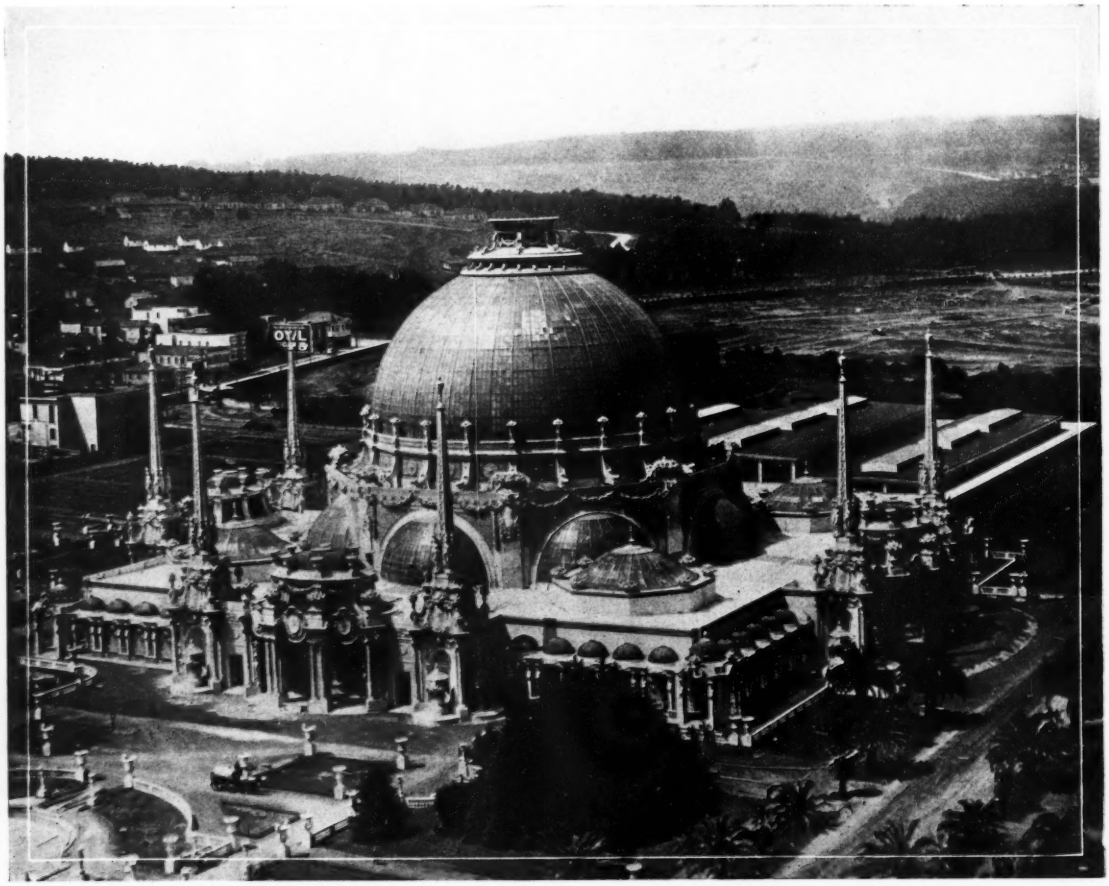
By A. A. Willoughby,

COMMERCIALLY speaking, the Panama-Pacific International Exposition being held this year at San Francisco, on the western edge of the American continent, marks a new epoch in the conduct of expositions. At the outbreak of the European war it was feared that the exposition could not survive were the war to continue, that it would at least have to be postponed to a more propitious date.

The fact is that the exposition opens February 20, the originally scheduled date, for a period of 288 days, a longer continuous period than any previous exposition. It will be complete and ready on that date in every detail. It will embrace a greater number of exhibits than has been assembled at any previous exposition. It will also disprove the belief that an exposition of such scope must needs be located near large centers of population to attract visitors in sufficient number to give it prestige. It is being held in the natural metropolis of a vast area of country which is just being opened up through the advent of increased transportation facilities.

The Panama Canal opens a new avenue of commerce for the products of the East to find their way to western markets; it affords newer and lower-priced means of transportation eastward for western products. The exposition will develop trade relations between the East and the West as nothing else could have done. The territory west of the Rocky Mountains, and which is more or less tributary to the

The Palace of Horticulture, where will be exhibited the most complete horticultural display in the history of world's fairs. The great glass dome, 152 feet in diameter, is patterned after the dome of the mosque of the Sultan Ahmed I, at Constantinople



OF THE PANAMA-PACIFIC IN-. EXPOSITION

Products will Find Wider Western Markets, Great Industrial Opportunities to the East

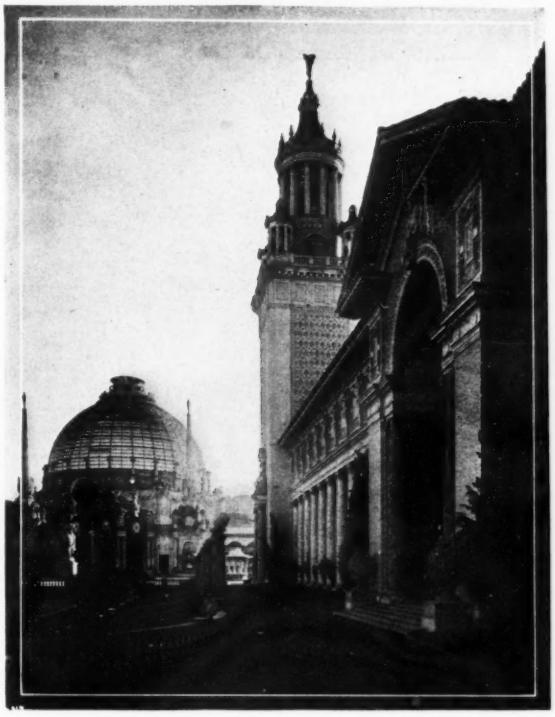
of San Francisco

Pacific seaports, is much larger than most people appreciate. It was a bold undertaking to attempt an exposition on such a scale, but the results attained will abundantly repay the effort.

Something of the history and growth of expositions is of interest. The idea can be traced back to the lunar feasts and seasonal festivals of our barbaric ancestors. The first fair of record where displays of goods were offered for sale or competition was held in Great Britain in 208 A. D. The earliest fair held in France occurred in 427 and was for political purposes. Fairs were held in the seventh century to promote Christianity.

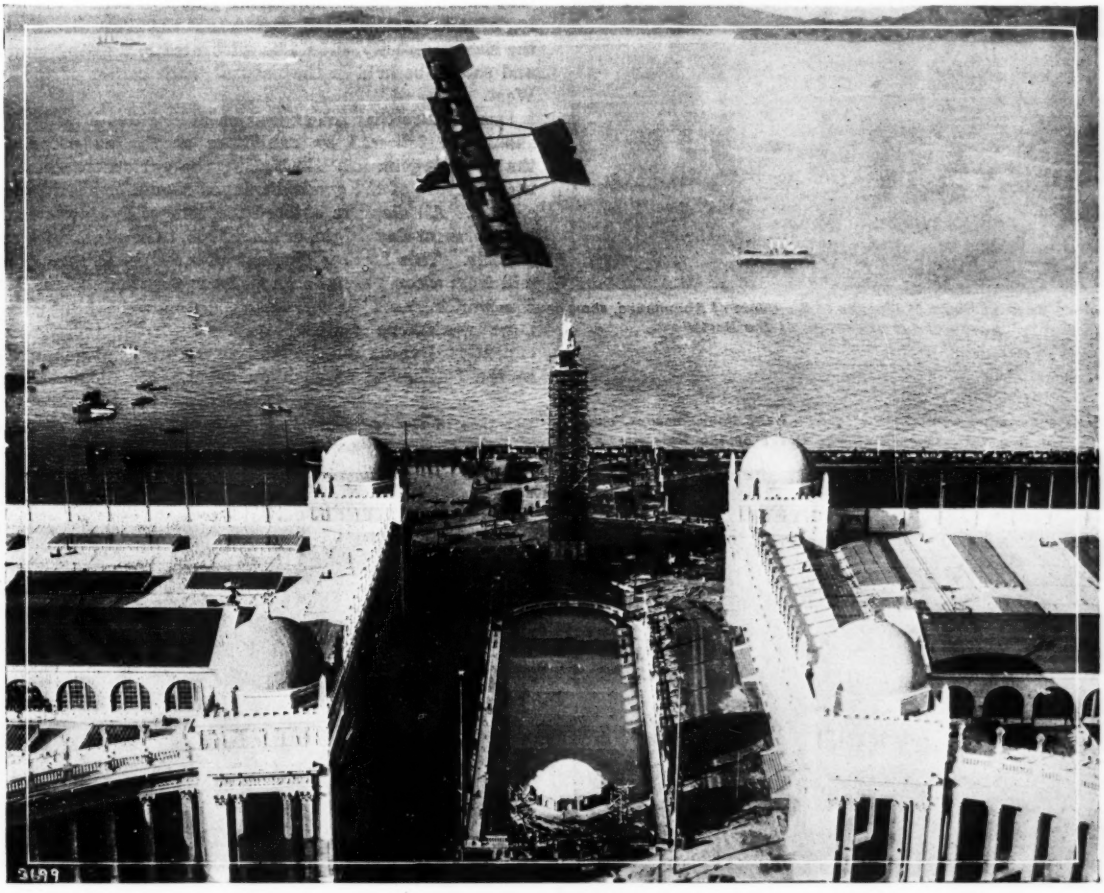
The annual fair had its beginning in England in 886, being introduced by King Alfred the Great. The annual fairs which continued to be held in England and France ranked, however, below those held in Russia. The daily attendance at the Russian fairs would sometimes run as high as 300,000, the aggregate sales as much as $100,000,000 and they were held for a period of three months. The first fair held in America occurred in Philadelphia in 1824 under the auspices of the Franklin Society. One was held in 1829 in New York City for the encouragement of agricultural and mechanical pursuits.

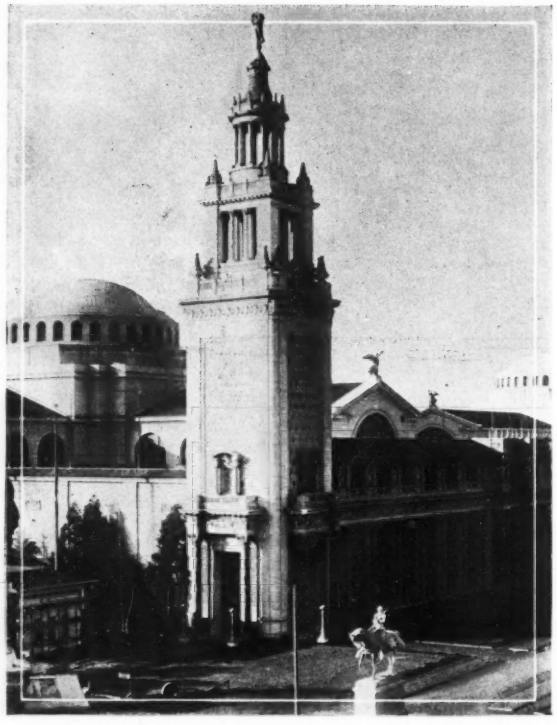
The inauguration of national fairs must be credited to France, which held one in 1789 and continued them until 1806, when they were interrupted by wars. An inter-



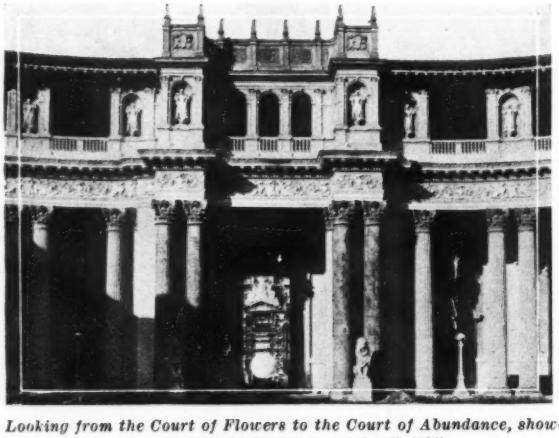
The Palace of Horticulture, as seen from the Court of Palms, with the Palace of Education to the right

Lincoln Beachey, famous for "looping the loop," flying over the exposition grounds in his aeroplane. The name is on top of the aeroplane, but San Franciscans have become accustomed to seeing it from the ground while the aviator rides upside down





Entrance to the Court of Flowers, showing Palace of Manufactures with its dome 100 feet in diameter



Looking from the Court of Flowers to the Court of Abundance, showing a part of the "Fountain of the Earth"

national exposition was held in Great Britain in 1851 in the famous Crystal Palace—a huge glass-covered structure erected especially for the occasion. The most important international expositions of recent occurrence are the World's Columbian Exposition at Chicago in 1893, one at Paris in 1900 and at St. Louis in 1904.

The magnitude of these expositions as gauged by their admissions and exhibitors may be seen in the following figures:

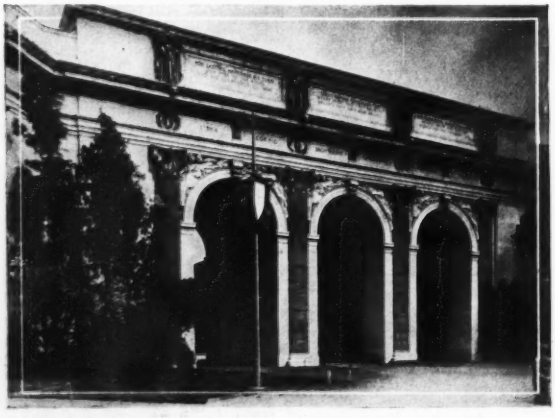
Chicago	Admissions	27,529,000	Exhibitors	65,422
Paris	"	48,000,000	"	75,531
St. Louis	"	20,066,000	"	55,000
P-P. I. E.	" (Est.)	20,000,000	"	80,000

The Panama-Pacific International Exposition differs in two essentials from previous expositions: it celebrates a contemporaneous event and it is being held in a section of country which is yet in the preliminary stages of development. California is a comparatively new State, the things that are proving her a rich storehouse of treasure being of but comparatively recent discovery. The days of the gold fever of '49 are not so many years past. The citrus fruit industry, the extraction of crude oil and its many and varied uses in the absence of coal as a fuel, lumbering, manufacturing—these have not yet begun to reach advanced development.

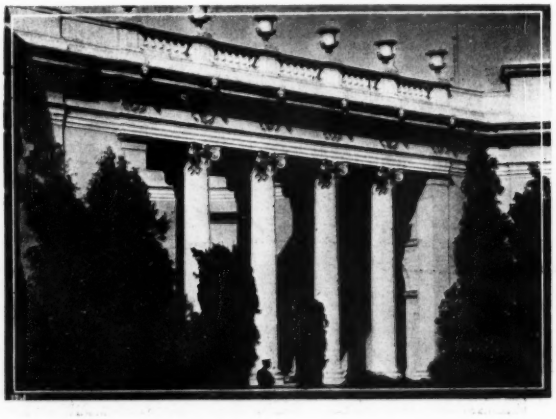
The combined area of the eight States west of the Rockies, California, Oregon, Washington, Idaho, Montana, Nevada, Utah and Arizona, comprises 886,386 square miles of territory. The varied products from this section will flow through San Francisco in large measure to eastern markets and to Europe now that a direct means of water transportation is afforded through the Panama Canal. This is a result of the new trade channel which has shortened the voyage between San Francisco and Liverpool from 13,517 miles to 7,830 miles, or a saving in distance over the route around Cape Horn of 42 per cent. The saving in time averages 50 per cent., a cut from 62 days to 31 days. The former distance between San Francisco and New York was 13,107 miles; now it is but 5,272 miles. It is fitting that such an industrial awakening as will follow the opening of the Panama Canal, throughout the West directly and the East indirectly, should be celebrated in a fitting manner and should be held in the natural trade center of the new West.

One feature that the exposition authorities have insisted should be followed by exhibitors as far as possible is that working models illustrating the various processes of manufacture of the goods displayed should be shown in the exhibit. All displays entered for competitive award must be of present-day origin, or since 1905, to be eligible for such awards. This insures displays of new goods throughout, and from a commercial standpoint is a most important one. The working exhibits will make of the eleven exhibit palaces huge workshops and laboratories. An instructive and educational value for the layman naturally attaches itself in the fulfillment of such an event. Practically all the

One of the main portals in the Court of the Four Seasons, one of the five units comprising the Court of the Universe



Entrance to the vestibule of the Palace of Machinery, among the most classically beautiful of the exposition structures

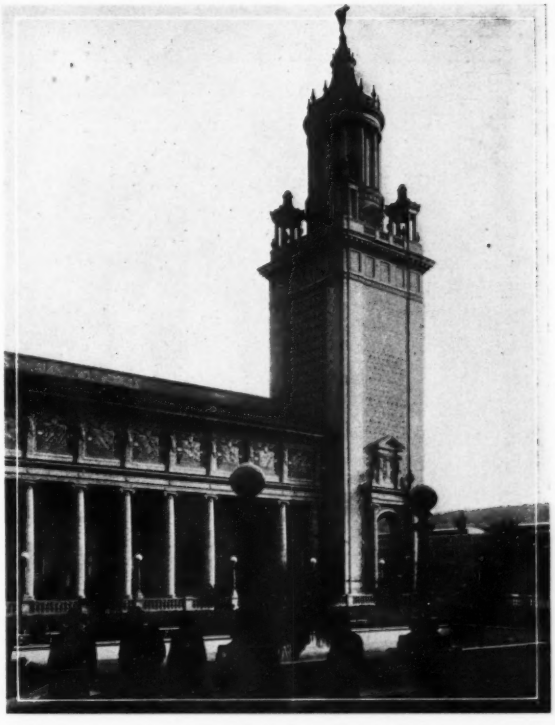


exhibitors state they are making the largest exhibits they have ever assembled for display purposes. This in itself will be one of the potent factors in making the exposition the greatest in history.

More than three hundred congresses and conventions have scheduled San Francisco as their 1915 meeting place, and will represent nearly every phase of human activity. The list is being added to at even this date. Delegates to these will find many things at the exposition in their various lines of work to interest them. The immense exhibit of the United States Steel Corporation and its subsidiary companies in the Palace of Mines and Metallurgy, covering nearly an acre of space, will furnish a rich field of study for the mining man and metallurgist. The general idea of how the operations of the country's largest corporation are conducted will be of general interest. The social, moral and physical welfare of the employee, which is one of the largest problems the employer of labor has to tackle to-day, is handled comprehensively in this exhibit and in that of the United States Government adjoining. The classification methods followed out in the grouping of exhibits have resulted in a saving of space for the exhibitor and in a saving of time and effort for the visitor. The mining exhibits from the various States are shown in the Mining Building instead of the various State buildings. The same is true throughout the other buildings.

Practically every State in the Union will be represented at the exposition and the various displays of products which will be made will be instructive in their nature. The State of Washington, which is one of the most progressive of the States, has spent millions of dollars on her highways the past few years and will have a comprehensive display in the Palace of Transportation covering her "good roads" work as separate from her other exhibits. The other noteworthy exhibit from Washington is in the Palace of Food Products and covers the details of the fishing industry, in which production Washington excels. It is the most complete fishery display ever assembled and covers 4,000 square feet of space. Every process from the catching to the consumption is clearly pictured. An exhibit of modern fish-canning machinery is made. The oyster, clam, crab and shellfish industry is shown in detail.

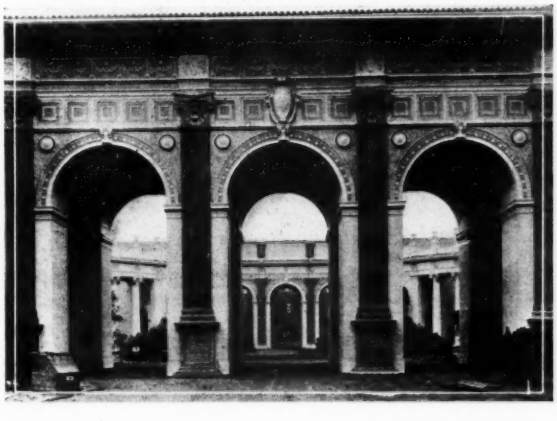
The attention of the foreign countries exhibiting has been given more to laying stress on the products in which they excel than to attempt to cover the entire field of their various activities. This has resulted in one of the greatest series of displays of foreign nations ever attempted in the history of expositions, and the most attractive. The Japanese and Chinese nations particularly have appropriated vast sums of money to exploit their products. Japan will have exhibits in each of the exhibit palaces, and will have typical villages in the State and foreign buildings section and in the amusement concessions district. Denmark will exhibit products from the Royal Danish porcelain factory at Copenhagen. The Canadian building is one of the finest



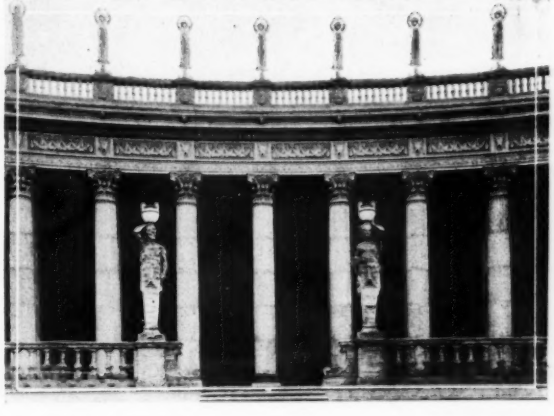
The Court of Palms, showing the Italian Tower and a section of the colonnade of the Palace of Education

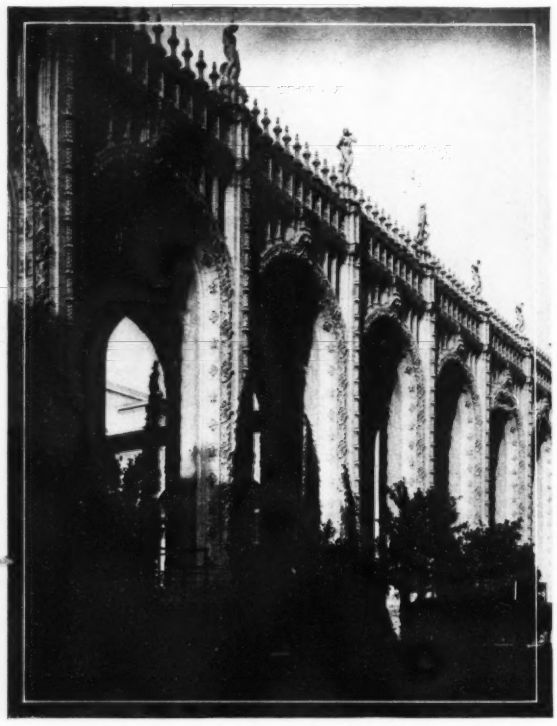
The main approach to the Festival Hall, where musical and other entertainments on a large scale will be held

The western entrance of the Court of the Four Seasons, which faces the Court of Abundance



Section of the gallery before the Palace of Agriculture, showing the decorative detail with which it is embellished





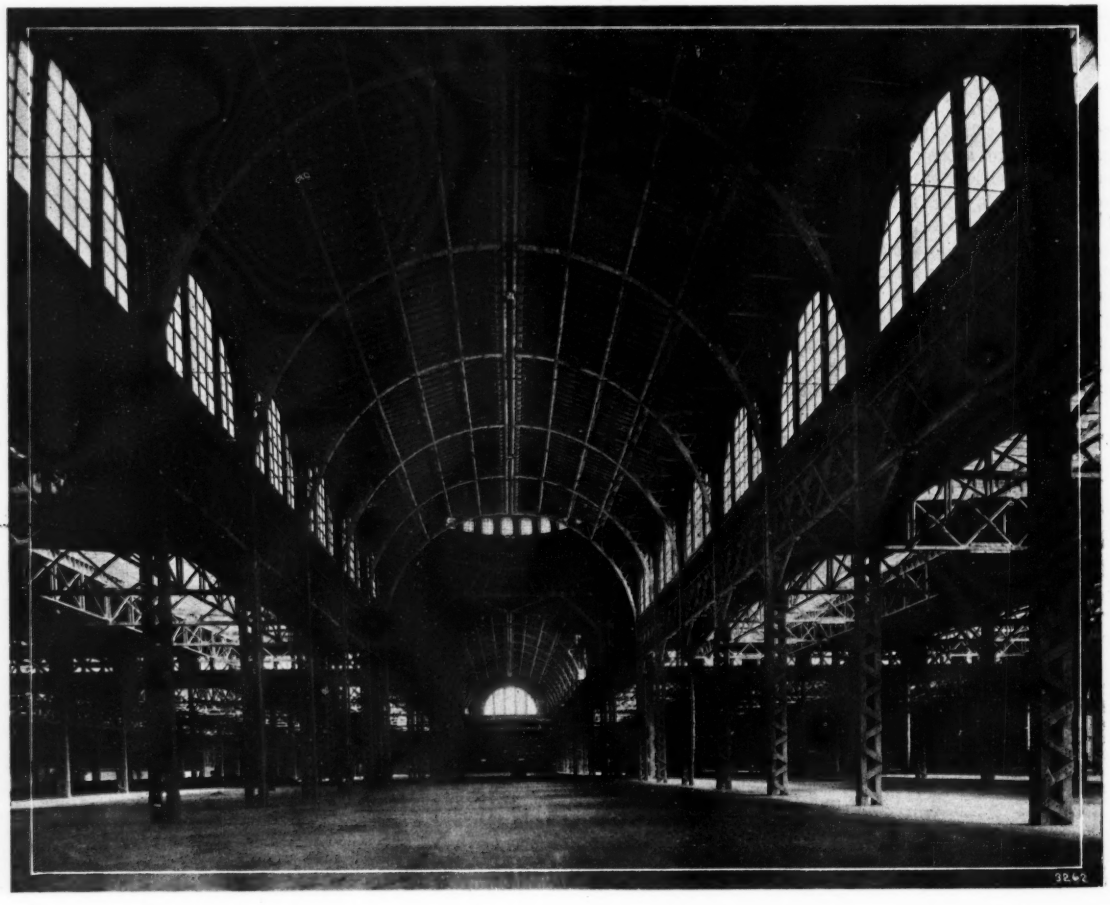
Section showing arches to the Court of Abundance—the decorative finish is entirely Oriental in effect

and most imposing structures erected in the foreign section and the displays housed therein are complete and full of interest. The news that France would participate officially as a nation and would rush the work on her pavilion was one of the most pleasing recent announcements made. The fact that she would carry out her original program and exhibit in spite of the fact that she is in the midst of a destructive war is of particular interest.

The live stock show will be the greatest in the history of the world. A continuous exhibit will be held and prizes aggregating more than a half-million dollars will be offered. Specimens of the famous Chillingham white cattle from Chillingham Park, England, have been given to the exposition for display purposes. This is the first time they have been seen outside their native heath.

In every department the exposition will prove a great trade stimulus, in bringing the people of the East and eastern products to the western gateway of the American empire and to show the visitors the vast extent of western territory to be developed. In this feature the 1915 exposition will be unique among expositions. The Panama Canal insures to the people of the West a stimulus for marvelous growth and the commemorative exposition marks the beginning of a new era of prosperity for both East and West.

An interior view showing the dimensions of the Palace of Agriculture. The floor area of this vast space is 328,633 square feet, and early in January it was being rapidly filled with exhibits from many parts of the world



EVERY new fashion represents the combined skill and effort of thousands of persons. Back of the designers are many mills and many dextrous craftsmen. In the making of silk, the gold of textiles, an army of expert spinners, weavers and dyers is employed in working out the hues and patterns and giving adequate form an expression to the ideas of the artists. So it is with all other fabrics, no matter what the material. The laces, embroideries and garnitures that enhance the beauty of the gown and of its wearer are the work of master hands. In the designing and manufacturing of apparel for men and women no other country can offer such a high development of great facilities as the United States.

AMERICAN GOWNS AND AMERICAN FABRICS

The New Fashions Require Much More Material and are so Radically Different that they Mark a Revolution in Style

Photos by Joel Feder, New York

THE world—long familiar with American foodstuffs—is now learning the excellence of the products of the mills and factories of the United States, for both the peoples at war and those at peace must be supplied with a wide range of articles. It is this condition that is now making new customers for American fabrics and fashions all around the globe.

The United States is particularly well fitted to meet these new demands, either as a producer or a manufacturer, or both. Its annual cotton crop is so great that a large surplus is exported after the domestic demand has been supplied. It is not a silk-growing country, but the output of its mills ranks with that of the greatest of manufacturers of textiles of this character. It is both a leading producer and manufacturer of wool. In the things which it has found cheaper to import—such as dyestuffs—America is now taking steps to establish similar industries within its own borders.

Afternoon gown of sand taffeta, stripes in needlework effect, black girdle edged with yellow, Chin Chin parasol with mahogany-colored birds, handle and tips. Gown by A. Deutsch, silk from Valentine & Bentley, hat from Moorhead & Jardine, parasol by Follmer, Clogg & Co.

All these things, especially as they relate to textiles, have an important bearing on fashions in women's apparel. They become all the more impressive when viewed in their connection with the recent change in styles, which is the most sweeping and radical that has occurred for many years. It would be impossible to estimate with any degree of accuracy the increase in the demand for fabrics of all sorts that is a consequence of the sudden shift in the feminine silhouette—from the scant, tight skirt to the full-fashioned one. It is so marked a change that every civilized woman must follow it or be obviously out of style.

This revolution in the world of fashion did not have its origin in the United States or in France or Germany or England. It was rather the cumulative force of an evolution that had been going on for a long time. The widespread unrest among women—their growing demands for wider fields of thought and action—found one of its expressions in their apparel. Like all world movements it was not entirely unexpected, but when it culminated it found the textile manufacturers of the United States less unprepared than those of any other country. This was partly due, of course, to the industrial paralysis or disorganization caused by the war abroad. American observers, however, owing to their geographical situation, were able to survey the field as a whole and to decide on the trend of fashions somewhat better than those in the style centers of Europe. Therefore, when the opportunity that was also a duty appeared, they were in a position to meet it promptly and adequately.

The influence of war as a great equalizer is also seen in to-day's fashions. The new silhouette is well-nigh universal and there are practically no styles that are more than ephemerally exclusive. On the other hand, there are very many styles that are striking in their individuality. These are especially notable among the products of American designers. Exclusiveness may be gained only by richness of material, the excellence of cut and the effective art that gives a distinctive personal touch to a garment. All these changes that have occurred recently in women's fashions have brought about a condition that in many respects is ideal; the average woman who ardently desires the latest styles at the smallest cost now can have her wishes gratified in a fuller measure than ever before.

In silks, taffetas will be of much importance, owing to the

wider skirt demanding a material that will be self-supporting. On the other hand, the low price of tussah silks and the possibility of adapting them to the new styles, is likely to make them popular also. Even the light, sheer weaves are in favor because they make up attractively when worn over satin and taffeta foundations, or when they are used in dresses where there are flounces—and there are many flounces in the latest fashions. Crêpe de Chine and crêpe Georgette are now manufactured in such excellent qualities and patterns, and at such low prices, that they are being largely used in ready-to-wear costumes that are sold at attractive figures.

In cotton dress goods sheer and semi-sheer fabrics have the first place. Organdies, both printed and embroidered, are very fashionable. Lace weaves are another novelty for the coming season, especially those where there is a combination of the lace idea with a close weave. The free use of embroidered figures in colors has intensified the interest of the leaders of fashion in printed voiles. A permanent finish for popular-priced qualities has been perfected. This finish, it is said, remains unchanged after repeated washings and will stand long wear.

Much of the discussion heard in the New York showrooms is in regard to the width of the skirts and the location of the waistline in bodices. The circular skirt will be the feature of the spring styles, but the ripple skirt which forms graceful folds with every turn of the body will also be widely popular.

The circular skirt may be plain with deep hems, or, in its more dressy form, may have several graduated folds or ruffles of silk from the hem to the waistline. Some of the models of the 1820-30 styles have one deep puffed band at the edge of an extremely full flare skirt. There are also models having circular flounces or narrow ruffles on a fairly narrow foundation. A suggestion of the swinging effect is given in the flounces, but at the same time they are held in to the foundation skirt.

It is expected that the popularity of high waisted effects and of the normal waistline will be about equal. The high waistline, however, is distinctly of another character than the Empire style recently in vogue. A slight raising of the waistline is an artistic necessity when the bodice is accompanied by the full and rather short skirt. The low or even the normal waistline with this sort of a skirt would dwarf the figure. In this and in coat lengths American designers have been particularly successful in attaining an artistic balance of the proportions of the figure.

The new waists are simple in line, but smart in effect—a combination that is difficult of successful achievement. Nevertheless, the making of waists of this sort is more the rule this season than ever before. The best designs have neither too much nor too little trimming, and even those of moderate price possess a touch of individuality that makes them seem of exceptional value.

The new styles in lingerie are following those in outer apparel. Petticoats of muslin are back again in the feminine wardrobe after an enforced retirement during the vogue of the tight skirt. They are shaped somewhat differently than their predecessors of recent years. The present tendency seems to be to make them comparatively narrow. One reason for this is that with the revival of the very wide skirt—particularly as advocated for dancing frocks—the need for the clinging foundation skirt has become greater.

The radical change in styles has affected the corset also, though not to such a degree as might be imagined. The corsets for the approaching seasons are very much like those that have been in vogue since last autumn.

Afternoon gown of brown taffeta, with new flared skirt and shirred effect. From Lane Bryant

Suit of shepherd check French serge with Gladstone collar of pique, hat of black Milan

Street costume of rose-colored corduroy with buttons of the same material. Note new circular skirt

POPULAR PRICED WHITE EMBROIDERED DRESSES

No. 1698

Made in 200 Styles
$45 to $120 Gold per Doz.

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Style, Fit and Material are of the Highest Class

One of Our Various Styles

No. 1698.—Made of fine mercerized voile. Waist is handsomely trimmed with fine net. Finished around neck with shadow lace. A bargain at $3.75

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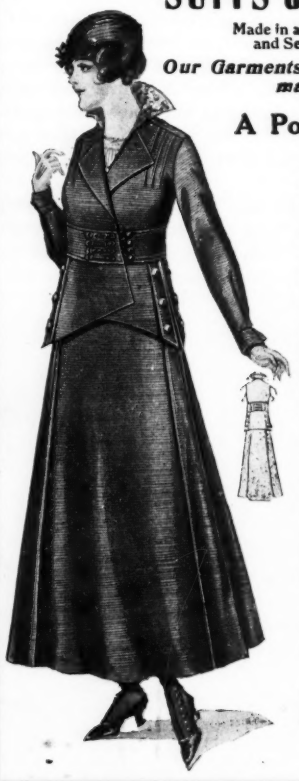
Distinctive Styles in Ladies' and Misses' SUITS and MANTLES



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We desire to grant exclusive territory to importers of Women's Wear who have facilities for selling the retail trade.

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Goods regularly rolled in 10-yard pieces, but easily changed to suit demand

Samples cheerfully submitted to Jobbing Trade or Large Distributors

HAT AND GOWN MUST BE THE SAME STYLE PERIOD

Selling Details that Often are Overlooked, but which are Important to Manufacturers and Dealers

EVERY milliner knows that a hat attractively displayed is half sold. There are various ways of approaching this problem of showing goods of this character to the best advantage. The first and most usual step, and the one involving the least effort, is to put the hats in the shop window. Many milliners go no further than this. When a customer enters it is simply a question of trying on one hat after another. But the customer may be—and probably is—wearing a tailored walking suit and be seeking a hat to go with a dinner gown, or with some other costume entirely different from the one she has on. This lack of appropriateness and harmony—discord, in fact—between the hat and the dress increases the difficulties of making the sale.

In many of the large millinery establishments in New York City models are employed to show off the hats. Each of these models—or mannequins, to borrow the more expressive French word—appears in a costume that matches the hat exactly. In this way the customer is able to see the hat under the most attractive conditions, and in its proper setting of apparel. In other words, the gown is designed to match the hat, rather than the hat being made a secondary consideration.

This method of the manufacturing milliners is even more important to the retailer who buys their product than to the consumer who wears it. Hats made under these conditions have an individuality and distinction that it seems impossible to secure in any other way. The genius of the creators of millinery is untrammelled. Women are quick to recognize this, and when contemplating the purchase of a new gown are inclined, more and more, to buy the hat first. With a hat that is particularly becoming, the selection of the gown of the proper lines and in fabrics whose colors harmonize and blend is relatively easy and the result more satisfactory.

Progressiveness in any line is always indicated by originality. One of the large manufacturing millinery houses in New York City has improved on the idea of exhibiting hats on living models in a particularly striking way by paying unusually careful attention to details. Ordinarily the mannequin wears the same dancing frock or dinner gown while showing a dozen different hats that may be worn with that sort of a costume, although the style periods of the hats and the gowns may be years apart. The firm in question insists on perfect harmony, not only in the color schemes, but in the fashion periods between the gown and the hat. The quaint "coal scuttles" and small shapes of the 1830 period, for instance, that are among the features of this spring's styles, are shown with dresses that match the hats in correctness. Large Rembrandt shapes of black lace, small mandarin hats with turned up brims and round crowned shapes of Empire green, are some of the other combinations that are favored.

Although some of the new models are trimmed with feathers, like ostrich or bird of paradise, this house is of the opinion that flowers will be largely used—generally small, odd-shaped flowers bunched together in small bouquets. Milan and Milan hemp are much employed for such shapes and for sailors with soft bulging crowns. Other shapes are very small, with narrow brims. The trimming is remarkably simple in most cases. The colors include an old Empire green, Belgian blue, pearl and dark gray, tête de nègre, black and absinthe. Three of the new models are shown in the illustration that accompanies this article.

Courtesy Mode Hat Co., New York

At left, a Gainsborough hat of dull green, trimmed in green and with faint rose and oyster-gray ostrich feathers; in center, small tête de nègre sailor; at right, French gray tulle hat with curled brims and shirred sides, violets front and back

THE RUSSELL MANUFACTURING COMPANY'S

Elastic Web Products and Cotton Belting

REPRESENT THREE GENERATIONS OF ACCUMULATED EXPERIENCE

WHY NOT BUY THE BEST?

Cotton Belting

Solid Woven Cotton Machine Belting

One of the most important products of the Russell Mfg. Co. is cotton belting in many widths and thicknesses up to 44 inches wide and ten-ply thick for both power transmission and conveying. They are water and climate proof. Russell cotton belts are used all through the Michigan lumber region, where the temperature ranges from 40 degrees below zero in winter to 100 degrees above in summer—the extremes of arctic cold and tropic heat.

Suspenders (or Braces)

A very important branch of this company's business is the making of suspenders. In addition to manufacturing and selling approximately 350,000 dozen suspenders a year, it makes elastic webbing for other suspender manufacturers sufficient for 1,000,000 dozen more. These goods are made to meet every taste and fashion around the world. The better grades are supplied packed in artistic boxes if desired.

Elastic Webbing

This company makes elastic webs of every variety, including corset webs, braids, and many other high grade and unusual varieties. These webs can be packed in any form to suit customer. For the retail trade Russell webbing is wound on reels and put in glass front cases.

Garter Webbing

Among the many varieties of elastic webbing made by this company is garter webbing, which is put up in attractive styles of packing to meet the requirements of every class of trade.

Cotton Harness

This company makes every kind of harness that can be supplied from cotton webbing, including truck harness standing a test of 5,000 pounds on each trace, fancy harness in brown, white or black; halters and headstalls in white, brown, blue, red, and striped web; and surcingles in every conceivable pattern.

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Brown Sheetings and Drills, Fine Cloths, Shirtings, Grey Ducks in a large variety of widths and weights.

1915 STYLES IN MOTOR CLOTHING

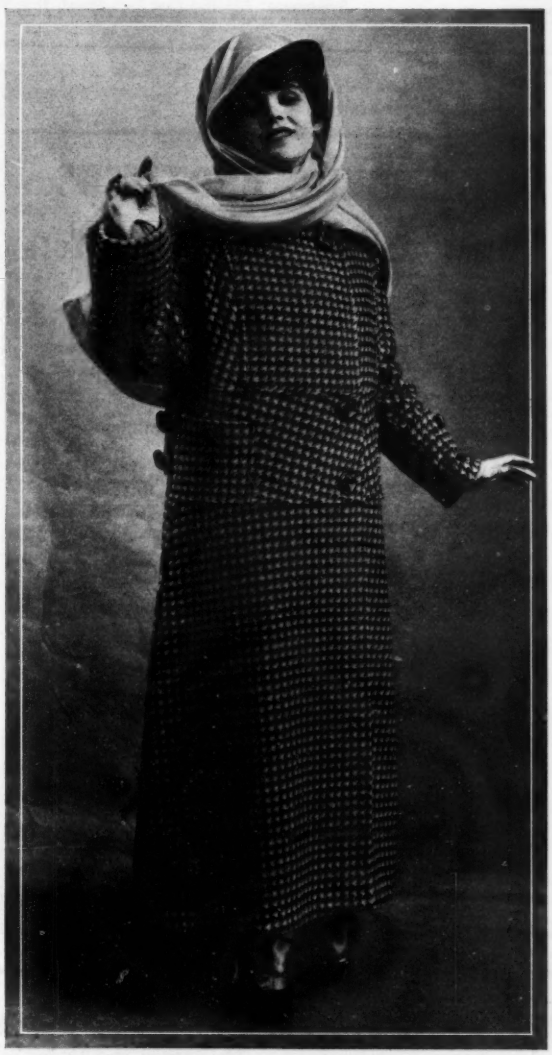
New Fashions Offer a Wide Range of Choice in Motor Apparel for both Men and Women

FASHIONS in hats and gowns change four times a year. In motoring apparel the styles vary materially only twice in a twelve-month—summer and winter. Despite this, however, there is a wide range to choose from, no matter what the season. The things that every experienced motor enthusiast demands, first of all, are garments that are comfortable, that in winter shall afford adequate protection against the cold, and in summer against the dust. They may follow closely the prevailing fashions in dresses, or they may pay no heed to them at all, and yet be correct in style. Apparel for motoring, therefore, is in a class by itself.

In winter, in the temperate zone, the woman motorist wraps herself in furs if she rides in a touring car. If she goes automobiling in a limousine she need not dress so warmly—a cloak of almost any heavy material, from tweeds to velvet, will do. In summer, however, when open cars are the rule, almost any light garments may be worn, extra wraps being carried for protection against the rain or the chill of the night air.

The dealer in motoring apparel, therefore, in selecting his stock, should bear in mind the climatic conditions where he is located and the tastes of his patrons. With these clearly defined, he will have no difficulty in procuring his requirements from the American manufacturers of such garments, as the United States, owing to its wide range of latitude and consequent extremes of climate, demands an unusually large variety of this sort of clothing. Because of this the designers and makers of automobile garb, in New York City especially, have excelled in the devising of new things to meet every need.

The latest American fashions in motoring apparel, for winter or summer wear, reflect the broad tendencies of style that have found a marked expression in other lines of dress. Automobile coats for both men and women are wide-skirted—they have the "flare" that is characteristic of the reversion to the styles of more than three-quarters of a century ago. From the fur coat to be worn in the touring car to the bright colored one for the limousine, women's coats are increasingly wide as they descend to the hem. The extreme in the styles of men's coats measures 114 inches in the length of the bottom hem. A coat of this description, however, is made of tweed or some similar fabric. Obviously, it would hardly be practicable in a leather or fur-lined garment, owing to the weight of the material.



Motor coat of black and white check mixture; buttons of tortoise shell; patch pocket on belt; motor bonnet of suède covered with white veil. From Lord & Taylor

The attractions of the Scotch tweed coats depend largely on the beauty of their colorings. Many of them are so warmly interlined that they have all the warmth of fur. In the ultra velvet coats especially, there is often a seam at about waistline depth, and to this the lower end and still fuller part is gathered on. Set-in, drop and kimono sleeves are used in the new motor coats, and a round yoke is often a new detail. Big, high collars are almost a universal feature. For midwinter wear they are lined with fur, and many have fur on both sides. Inexpensive furs, such as muskrat or raccoon, or their imitations, serve the purpose.

Velvet coats on tailored lines will also be much worn by those who ride in closed or covered automobiles, as they also make good afternoon or evening coats. Velveteen, chiffon and cut velvet are used in warm, bright colorings. Most coats of this sort, when they are to be worn much in cold weather, have a thin wool interlining that adds to their warmth. Sand colored gabardine coats, made very full, with the new shirred back and high crush collar, are also a feature of the new styles.

The woman who prefers not to wear a heavy wrap, and yet wishes to be properly protected against the inclemencies of the weather, looks with much favor on the short coat or sleeved vest that can be worn over the blouse, but beneath the loose outer wrap. These vests come in varying weights and materials. Where sharp, chill, penetrating airs are likely to be encountered a vest lined with chamois affords almost perfect warmth. Usually, no matter of what material this vest is made, the sleeves are of silk.

Somewhat less attention than heretofore is paid nowadays to headgear for motoring. Far more thought is given to the veil, for the custom of wearing street hats covered with veils is growing rapidly. When the motorist removes her veil and slips out of her loose coat she is correctly appareled for walking or calling or dining. The latest veil is circular in form and of wide diameter. It is gathered in the center by a button, which becomes the top of the veil when it is in place. Its length enables it to be wound about the throat in much the same way as the ordinary automobile veil. Made of heavy chiffon, or some other appropriate material, it is an excellent shelter against the dust which is one of the few drawbacks of motoring. Automobile hats, however, will continue to be much worn.

NO STOCKING IS PROOF AGAINST SHARP TOE-NAILS, HENCE PROPER TRIMMING OF THEM IS ESSENTIAL.

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LADIES' BLOCKED HATS

of Straw, Milan, Hemp, Milan Hemp, Satins, Felt, Plushes, Velvets and all Seasonable Materials

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New York, U. S. A.

Photo from Commission for Relief in Belgium

One of the long bread lines in Brussels, where all class distinctions are obliterated by hunger and need

FEEDING 7,000,000 DESTITUTE BELGIANS

(Continued from page 80)

in the hills beyond Liège had to depend on wagons and such horses as could be found to get the food there, and many towns have been down to the last loaf before the supplies reached them.

By the middle of November it was estimated that the American Commission had delivered into Belgium about 17,000 tons of foodstuffs, but the need had increased so rapidly that at least 80,000 tons were required each month thereafter. The first consignment of flour for Liège left Rotterdam November 8 on motor vans flying the American flag. Prior to the arrival of this supply it was reported that the city had been without bread for two weeks.

By this time the realization of the urgency of the situation had become so general in America that every effort was made to hasten the loading and dispatching of additional relief ships. At Philadelphia all of the daily newspapers combined to make full page appeals for help to their readers in order to complete the loading of the Norwegian steamship *Thelma*, then in the Delaware River. This vessel sailed direct to Rotterdam on November 12, with a cargo of 1,740 tons. On November 25 the S. S. *Orn* sailed from Philadelphia direct to Rotterdam with a cargo of 2,025 tons. Meanwhile, on November 17, the S. S. *Tremorvah* arrived at Rotterdam from Halifax, bringing a cargo of 3,500 tons of flour, potatoes, cheese and canned goods—the gift of the people of Nova Scotia. This was the first vessel from America to actually arrive at Rotterdam and the American Commission immediately sent a part of this welcome cargo to Malines, St. Nicholas and other points in Northern Belgium where the need reported by the local officials was very great.

On November 19, as a result of the urgent recommendation of Ambassador Page that the work of the various organizations for Belgian relief should be co-ordinated in order to prevent duplication of effort and confusion, the Commission for Relief in Belgium, whose work had been so effective at London and Brussels, was also established at New York under the direction of Mr. Lindon W. Bates, Vice-Chairman. Offices were opened at 71 Broadway and the Commission took entire charge of all shipments to Belgium from the United States. The Commission created a vast pipe line organization for the collection of food and supplies in America and their transportation to Belgium that includes 31 steamships and the use of the 65,000 postoffices in the United States and the 35,000 offices of six of the leading great American express companies. In all of these notices are posted instructing the people how to forward relief supplies—at the expense of the Commission, if desired. The Commission, while it has not directly solicited funds, has done all in its power to stimulate the building up of local organizations for that purpose—with the result that there are now active and efficient collection organizations at work in nearly every State in the Union.

The traffic department keeps track of every consignment, whether a single package, a carload or a trainload, and supplies full instructions regarding shipping. State assembling depots have been established and forwarding agents appointed in every State in the Union, while arrangements have been made to receive shipments at the following terminal ports: New York, Boston, Philadelphia, Baltimore, Norfolk, Charleston, New Orleans, Portland, Ore., Seattle, San Pedro, San Francisco and Tacoma. Many of the railroad companies donate free transportation and where this is not done payment for freight is made at New York.

It is difficult to adequately describe the enthusiasm and earnestness with which Americans from one end of the country to the other took hold of the movement to meet the urgent need in Belgium as soon as the seriousness of the situation became known. In Kansas, under the leadership of ex-Governor Stubbs, 10,000 active workers were organized and 50,000 sacks of flour donated in three days, while the people of that State assured the Commission that they would be able to furnish at least 50,000, and possibly 100,000, barrels altogether. In Iowa each of the 99 counties arranged to send a carload or more of food. At San Francisco an entire shipload was dispatched, the Chambers of Commerce of San Francisco, Oakland and San Diego alone presenting $250,000 worth of food. Contributions to the Belgian relief funds have been received from Alaska, Hawaii, Porto Rico and from every State in the Union. The contributors range from men of wealth sending checks for thousands of dollars to school children enclosing a few pennies. The consignments of articles for the Belgians range from shipload lots to parcel post packages of a pound.

During the month of December and the early part of January the following vessels were dispatched to Rotterdam:

	Tons
S. S. Agamemnon, from New York, Dec. 4	2,720
S. S. Batiscan, from Philadelphia, Dec. 6	6,780
S. S. Maskinonge, from New York, Dec. 10	7,000
S. S. Neches, from New York, Dec. 12	6,750

Refugees from Malines registering at a relief station in Ghent. This work has been carefully systematized everywhere

Photo copyrighted by International News Service

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O'CALLAGHAN & FEDDEN,
121-123 E 24th St., New York City, U.S.A.

	Tons
S. S. Camino, from San Francisco, Dec. 8	6,500
S. S. Ferrona, from Philadelphia, Dec. 24	6,850
S. S. St. Kentigern, from New York, Dec. 24	6,850
S. S. Industry, from Philadelphia, Dec. 31	5,570
S. S. Harpalyce, from Boston, Jan. 1	8,470
S. S. Hannah, from New York, Jan. 5	6,850
S. S. Massapequa, from New York, Jan. 7	4,300
S. S. John Hardie, from Baltimore, Jan. 9	6,000
S. S. Lynorta, from Norfolk, Jan. 11	5,350
S. S. Kassala, from Baltimore, Jan. 14	5,160
	85,150

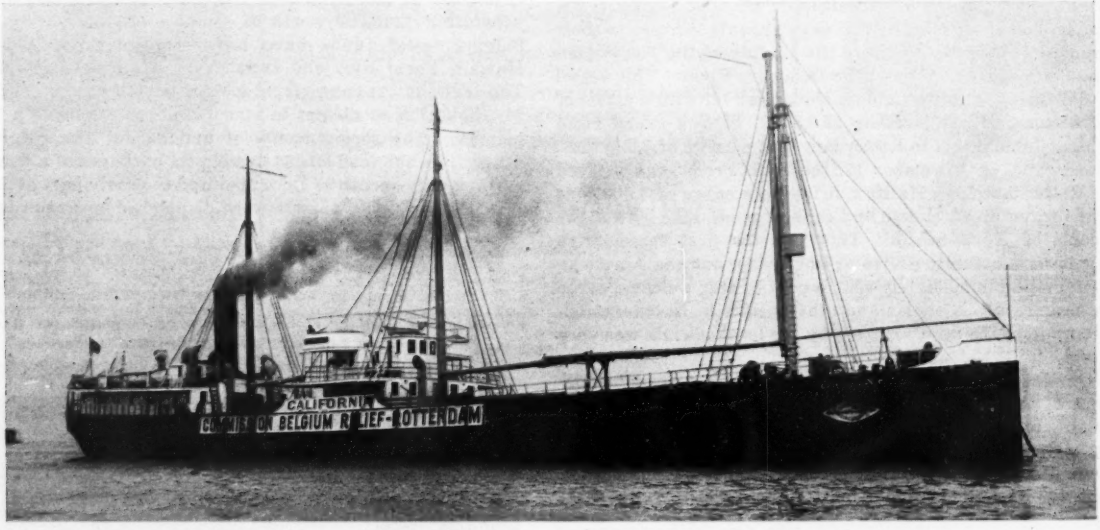
Offices of The Belgian Relief Fund, which has collected upwards of $900,000 thus far, and Rev. J. F. Stillemans its President

The latest plan for concentrating the effort to relieve the need in Belgium has been to send, if possible, a ship for every State. The *Camino*, which was loaded in California, was the first vessel to come from a single State. This ship passed through the Panama Canal December 28 and put into the port of New York for fuel January 9, then proceeding direct to Rotterdam. On January 5 the *Hannah* sailed from the Bush Terminal, Brooklyn, with a cargo of 6,850 tons of food worth about $300,000, the gift of the people of Kansas to Belgium. The State Committee did not disband on collecting this cargo, but proposes to continue to collect food supplies for Belgium as long as the need lasts. The ship was recorded on the books of the Commission as "Kansas Relief Ship No. 1," to indicate that more are likely to follow as a result of the bounty of the people of Kansas. On January 9 the S. S. *John Hardie* sailed from Baltimore carrying a cargo given by the people of the State of Maryland, and a day or two later the steamer *Lynorta* sailed from Norfolk bearing the gifts of the people of Virginia. Another ship carrying a cargo from the Carolinas was scheduled to sail the following week. In the States of Ohio and Nebraska active campaigns are also under way to raise funds needed to fill a ship from each State. The Ohio Committee includes Hon. Myron T. Herrick, the former American Ambassador to France, and Brand Whitlock, the American Minister to Belgium, also a native of that State. The Ohio relief ship will be the 8,300-ton steamer *Naneric*, which will carry a cargo valued at about $400,000. At present State Committees have been organized in about 40 States, and it is not too much to say that the work of relieving Belgium until that brave little nation is in position to take care of itself once more has only just begun.

The following is a partial list of the steamers now in transit to America to load, as reported by the Commission early in January. The dates given are, of course, only approximate:

	Tons
S. S. Washington, for Seattle; due Jan. 7	7,500
S. S. Cranley, for Portland, Ore.; due Jan. 15	6,800
S. S. Strathtay, for Portland, Me.; due Jan. 17	6,500
S. S. Uganda, for Norfolk; due Jan. 17	6,800
S. S. Aymeric, for New York; due Jan. 22	6,400
S. S. Wabana, for New Orleans; due Jan. 22	6,750
S. S. Great City, for New York; due Jan. 24	9,000
S. S. South Point, for Philadelphia; due Jan. 24	6,100
S. S. St. Helena, for Charleston; due Jan. 30	7,000
S. S. Batiscan, for New York; due Jan. 24	6,750
S. S. Lincluden, for Baltimore; due Feb. 1	5,500
S. S. St. Kentigern, for Baltimore; due Feb. 4	6,850
S. S. Ferrona, for Baltimore; due Feb. 5 (2d charter)	6,850
S. S. Comeric, for Portland, Me.; due Feb. 10	5,580
S. S. Daventry, for Baltimore; due Feb. 15	5,580
S. S. Cambrian King, for Baltimore; due Mar. 5	5,350
S. S. John Hardie, for Baltimore; due Mar. 15 (2d ch.)	6,000
S. S. Naneric, for New York; due Mar. 1-20	8,300
S. S. Strath II, for Portland, Me.; due Feb. 5-Mar. 5	6,500
S. S. Aymeric, due Mar. 1-15 (2d charter)	6,400
S. S. Strath III, due Feb. 10-Mar. 10	6,500
	139,010

These vessels, together with those previously mentioned, give an aggregate tonnage of 231,458 tons of shipping engaged in the work of Belgian relief on the routes between the United States and Rotterdam. This total does not include steamers sailing from Canada or Great Britain, whose cargoes are also distributed by the American Commission. Probably there never has been an organized charity in which the expenses of operation were so small as in this movement for the relief of Belgium. Anyone sending checks to the Commission for Relief in Belgium, 71 Broadway, New York, U. S. A., may feel that out of every dollar contributed to this cause the Belgians receive nearly 100 cents in actual food—which is a remarkable showing. Belgium to-day needs the help of all the world. What has already been accomplished is only a beginning. It is earnestly hoped that every reader of this paper who has not already done so will find some way to contribute his share toward keeping Belgium's 7,000,000 people alive this winter.



The S. S. Camino, which was loaded with gifts from the people of the State of California. After passing through the Panama Canal the Camino put in at New York, January 9th, for more fuel

The WORLD'S MARKET PLACE

FOR thousands of years mankind has been going to the markets where buyers and sellers could meet and exchange commodities on terms of mutual confidence and good will. Starting with little local fairs at which the housewives of a few adjoining towns and villages secured the necessities of the coming week, and a few itinerant merchants offered various small wares to those who cared to buy, these markets expanded until certain large cities became trading centers for a vast variety of merchandise and the meeting place for men from many far-off lands. The twentieth century, with its many epoch-making inventions, destroyed to a large extent these markets to which buyers came in person and substituted a system of exchange whereby the produce of many manufacturers reached the retail distributor in his own home town—after being introduced by salesmen, advertisements and in other ways—thus enabling him to purchase the requirements of his trade without crossing his doorstep. So perfect had the world's systems of communication and transportation become that the merchant knew that, once his order was placed, the goods would in due course be delivered safely at his door.

To-day the great war has, for the time being, shattered the vast fabric of international trade relations thus laboriously built up by past generations. Buyers can no longer communicate with many concerns that formerly furnished certain of their requirements, while others are no longer in position to ship—or even to manufacture—the lines they were wont to supply.

In this situation DUN'S INTERNATIONAL REVIEW believes that it can perform a most useful work in aiding such buyers to get in communication with other firms who may be able to supply some of their needs. Several pages of this issue, therefore, have been devoted to condensed summaries of *all* the products of a considerable number of representative firms. Similar lists will appear in subsequent issues, and if these pages are laid aside and kept they will form, it is hoped, a most convenient guide for buyers who are in doubt as to where they can now obtain certain specialties or lines that formerly were imported from countries whose export trade has been affected by the war. In most cases the lines mentioned are completely described and illustrated in special catalogues issued by the firms mentioned, and the best plan for obtaining full information regarding them is to write at once to each firm requesting catalogues on the line desired, together with price lists and export terms.

Drying Machinery for All Materials

THE Philadelphia Textile Machinery Company, Philadelphia, Pa., U. S. A., makes a specialty of drying machinery for all kinds of materials, and builds nothing else. In writing them it is important to state the kind of stock to be dried, the number of pounds—dry weight—that must be produced, and the available floor space. With this information an estimate can be furnished on a machine capable of doing the work. The machines made by this company are used in the largest plants throughout the world, for drying soap, silk, paint, tobacco, cocoanut, copra, cotton, wool, leather, yarns, hemp, etc.

Metal Beds, Cribs, Couches and Mattresses

BEDS that are sanitary and comfortable are now so moderate in price that they are well within everyone's means. Perfected machinery and production on a large scale have brought this about. American metal beds and woven wire mattresses are used all over the world. The Simmons Manufacturing Company, Kenosha, Wisconsin, U. S. A., make brass and steel beds, wire mattresses, spring beds, cots, cribs, couches and folding chairs. In steel beds alone they have 250 different styles, which indicates the variety and volume of their output. Dealers will find both interest and profit in a perusal of this firm's catalogues.

Telephones and All That Pertains to Them

THE Kellogg Switchboard & Supply Company, Chicago, Illinois, U. S. A., are designers and manufacturers of telephone equipment for rural lines, city exchanges, inter-communicating service, private extension lines, railroad work, mines, government service—practically every field where the telephone is used. Their product, therefore, covers a wide variety of apparatus, together with everything employed in its operation and maintenance. Their catalogues may be had in English, Spanish and Portuguese.

Spark Plugs for Every Condition

THE spark plug is a small but highly important part of every gasoline motor, particularly on an automobile. The Benton spark plugs, made by the L. F. Benton Company, Vergennes, Vermont, U. S. A., are case hardened and will stand up under the most severe tests. Their mica insulation is spirally wound and lapped, and is guaranteed never to leak gas, crack or break down. These plugs, which are made in all standard sizes and types and for all conditions of service, are fully described in the booklets issued by the manufacturer.

Lighting and Heating Systems

GASOLINE and kerosene lighting appliances of all descriptions are manufactured by the Doud Lighting Company, 139 Sangamon Street, Chicago, Illinois, U. S. A. The light is produced by hydro-carbon gas combined with air, this method of vaporizing the kerosene or gasoline furnishing the nearest approach to daylight that has been achieved by an artificial illuminant. The lamps made by this company are of a wide range of styles and sizes for indoor and outdoor use, singly, or in systems where the illuminant is supplied by a central plant. This company also makes oil stoves, ovens, sad irons and motorcycles.

Automatic Refrigerators

CLEANLINESS and economical refrigeration are the two prime necessities of a refrigerator. The Illinois Refrigerator Company, of Morrison, Ill., U. S. A., state that their products are manufactured especially to satisfy these two requisites. In all of their automatics the walls are of kiln-dried ash, which makes the inside case odorless, the linings are either zinc, enamel or vitrified porcelain, and the removable shelves of tinned steel wire. In addition to their regular catalogue, a pamphlet entitled "The Get More Business Book" is published especially for dealers who handle their product. They also make a full line of school furniture.

Carriage Dashes, Folding Chairs, Steel Hames and Chains

WHILE the McKinnon Dash Company, Buffalo, New York, U. S. A., are large manufacturers of leather dashes and fenders for wheeled vehicles, they also make a great variety of steel frame folding chairs, chains and steel hames. Their folding seats are unique in that all parts are electrically welded together, bolts, screws and rivets being eliminated except at the joints where their use is unavoidable. Their steel hames consist of two pieces of selected steel, cut and shaped separately and then forced securely together in powerful presses. They will not buckle or bend, and are among the strongest hames on the market. Further—and this is particularly important in humid climates—they are subjected to a treatment which prevents them from rusting. There are hames of every size and for every requirement. Their electrically welded steel chains have no weak spots. The catalogues of this company also contain full information as to weights and packing of export shipments.

Asbestos Packings

MILL and plumbing supply houses, garages and wholesale hardware concerns will be interested in the "Longwear" line of asbestos metallic sheet packings and handhole and manhole gaskets, high pressure and ring packings, asbestos metallic tape, asbestos valve stem packing, and compressed jointing in sheet of gasket form. The above mentioned materials are particularly for factory use. For the automobile trade the Asbestos & Rubber Works, Camden, N. J., U. S. A., manufacture "Longwear" asbestos brake lining, copper and asbestos intake, exhaust and manifold gaskets, spark plug yarn for carburetors and valves for automobile engines. Catalogues will be sent on request.

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Pink shell cameo, $4.75

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Real topaz or amethyst 3.40
Reconstructed ruby or reconstructed pink sapphire.... 3.80

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Reconstructed ruby..... 6.00
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Information for Buyers

As it is frequently impossible for advertisers to explain clearly the purpose or peculiar merits of their products in the advertising columns, space in this section is placed at their disposal to enable them to do so. It is proper to add that they, and not the publishers, are authority for the statements made.

A Complete Line of Road Machinery

THE widespread use of motor vehicles at the present time has increased the economic importance of roads. One of the great problems of the day is how these roads may be constructed and maintained. Messrs. Carr & Tyler have placed on the market a complete line of up-to-date road machinery which they claim will answer every requirement in the building and improving of the highway. One of the most useful and efficient machines made

A double-cylinder traction engine, showing rear driver, belt pulley and heavy boiler

by this concern is the combination roller and traction engine. This machine will do a great variety of work, such as rolling roads, driving a rock crusher or other heavy machinery, and drawing every type of road apparatus. To use the engine for running a temporary crushing plant a belt is connected to the fly-wheel, and the power is transmitted directly. When the machine is to be used for hauling, cleats are bolted in the rear drivers, the two middle front rolls are taken out, and an anti-skid band is bolted to each outside front roll. These attachments can be speedily removed and the tractor is then suitable for rolling.

In the spring a heavy machine is needed to cut out ditches and scrape off shoulders of country roads. The "National Hercules" or the "Climax Jumbo" reversible road machines are very well adapted to meet this demand for heavy work. One of their most notable features is the offset pole attachment with a steering device by means of which the tractor can be kept in the middle of the road on hard soil while the machine is working in the ditch or on the side of the road. This offset pole is not a part of the regular equipment, but will be furnished on special orders.

The "Little Winner" steel reversible road machine is especially designed for light work. To use a heavy road machine and true-up the road every time it needs a little repairing is manifestly an expensive process. To avoid such expense this light, two-horse machine has been invented. It is well balanced with strong and durable parts and heavy enough to stand up to its work. This concern offers many other types of road machines. They are all designed to stand excessive strains and are claimed to be practically unbreakable.

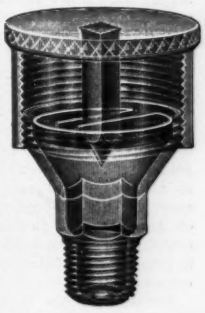
The road-building and repairing devices mentioned above are only a few of those which this concern can offer. Their line is very extensive and complete. For additional information address Carr & Tyler, 50 Church Street, New York City, U. S. A.

A Line of Improved Oiling Devices

ONE requisite of a grease cup or other oiling device is that it shall not leak—that it shall distribute the lubricant exactly and only where it is needed. Others are lightness, strength and durability. All these are among the excellent features that distinguish the product of The Winkley Company, Detroit, Michigan, U. S. A.

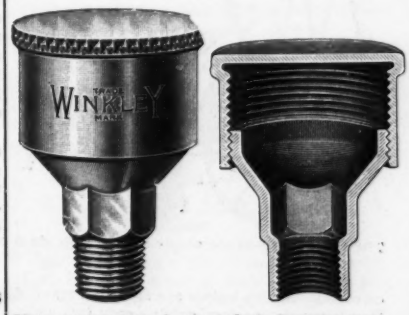
The Winkley grease cups are made of sheet metal and are drawn or pressed to their final shape or form by a process that is owned and controlled by the manufacturers. In this way exact uniformity of thickness of metal is assured throughout—there are no weak spots. The oil cups are made of brass, on automatic machinery. The thread sizes and the diameter of the wrench part or hex, therefore, are very uniform. Standard taps or wrenches will always fit these cups.

The plain compression brass and steel grease cups are pressed from sheet metal, making them stronger and better than cups that are cast. These cups can be furnished with a female thread on the shank which does away with the use of a coupling when used in connection with a pipe or nipple to bring the cup to the desired height above the bearing. Another of the many styles of oiling devices made by this company is the ratchet grease cup—supplied in brass, steel and also combination—which is so constructed that the jarring off of the cap is absolutely prevented. The locking device is entirely inside, and the external appearance is that of a regular pressed metal cup. A distinctive feature, not found in other ratchet cups, that the tongue is spot welded to the cap end engages in the spring in the base as soon as the cap has been screwed on one-half turn. This makes a simple and effective locking device.



A reliable ratchet grease cup

Among other styles of grease cups made by this company are the "Dustproof" ratchet, "Sterling," "Acorn." In the oiling devices are ten styles of oil hole covers. Some of these are self-closing and all are dustproof, and some can be furnished in extra lengths.



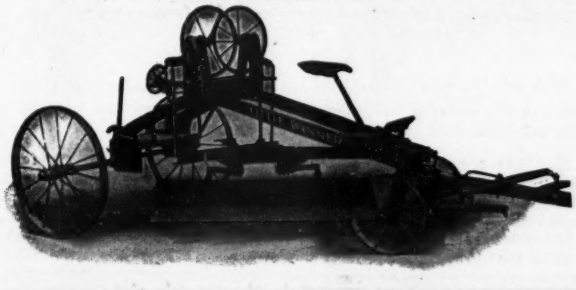
Plain compression brass and steel grease cups, the sectional view showing female thread

Their oil cups—which have a greater capacity for size than cast cups—have screw or hinged tops. They are furnished in plain and polished brass finish, also in steel if required. An extensive line of special oilers is manufactured to order when required in large quantities.

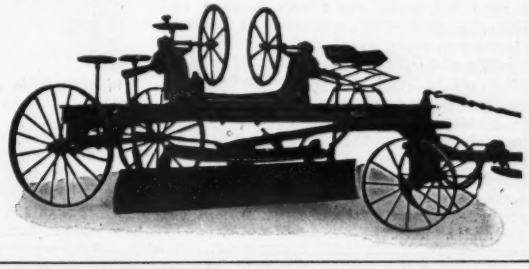
Shackle bolts are another specialty of this company. They are made from open hearth and cold-rolled steel hardened by a scientific process. All strain is relieved by tempering the bolts in boiling oil. Bolts are supplied with a number of assemblies, one of which is the plunger type of force feed and is very efficient and neat in appearance.

Prices and further particulars can be procured promptly by addressing the company as above.

A type of road machine for dirt roads designed for heavy work and drawn by a tractor



A light reversible road machine which is suitable for smoothing, leveling and grading dirt roads

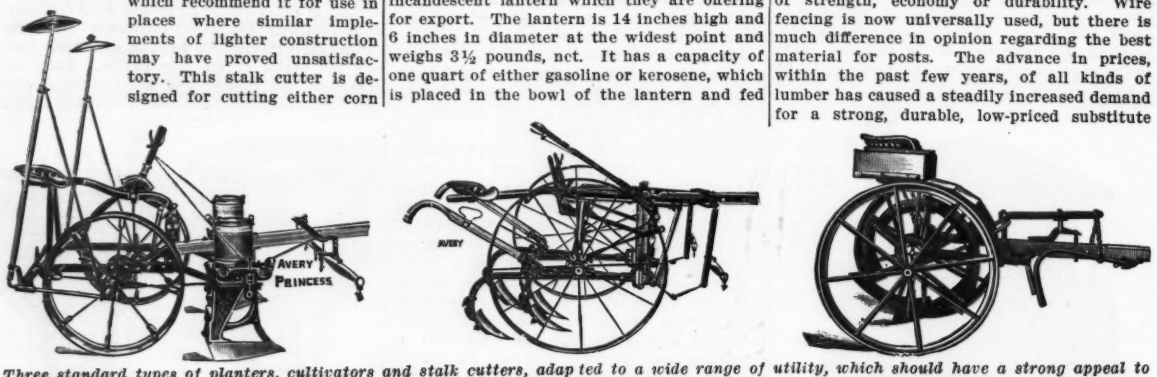


Three Standard Farm Implements

ANY farmer who owns the three implements shown in the accompanying illustrations is provided with a large proportion of the equipment necessary on an up-to-date farm. No. 1 is a planter that, while especially designed for corn, is adapted for many other kinds of seeds, such as cotton, beans and peas. It has a number of exclusive features, one of which is the improved system that guarantees a correct check, a perfect drop and a uniform depth. The value of the latter in obtaining a perfect stand of corn is now well understood by all progressive agriculturists. The implement is balanced so that there is no strain on the necks of the horses. If desired, an attachment can be added which will transform it into a very efficient fertilizer distributor in connection with the seeder.

Illustration No. 2 represents a cultivator of improved design that can be used for cultivating practically any plant growing in hills or rows. It is of extremely light draft, and the means of control have been so perfected that the shovels can be made merely to skim the surface of the ground or to thoroughly stir it to a depth of six inches or more.

The stalk cutter shown in the third illustration is especially strong, durable, simple of construction and easy of control—qualities which recommend it for use in places where similar implements of lighter construction may have proved unsatisfactory. This stalk cutter is designed for cutting either corn or cotton. As the knives are spirally arranged, it cuts across the row, cutting only two stalks at a time, which makes it easy for both the horses and the machine. The shape of the knives enables the machine to cut the stalks on the ridges as well as in the hollows without touching the ground. By means of adjustable levers the depth of the cutting can be regulated by the operator. These machines are made by the Avery Company, 401 Iowa Street, Peoria, Ill., U. S. A., who will be pleased to send to any address catalogues in which they are fully described.



Three standard types of planters, cultivators and stalk cutters, adapted to a wide range of utility, which should have a strong appeal to the up-to-date farmer everywhere

Waterproofing for Concrete

THE desirability of rendering concrete and cement construction absolutely waterproof and the difficulty in attaining that result are so universally appreciated by builders and contractors that these will be much interested in the catalogue just issued by the Sandusky Portland Cement Company, of Sandusky, Ohio, U. S. A., describing their Medusa Waterproofing. This waterproofing is a dry powder, which, mixed dry with the dry cement before the sand and water are added, becomes an inseparable part of the concrete. It renders it impermeable to water and prevents discoloration and efflorescence. It is said to give perfect results, and it does not affect the strength, setting or color of Portland cement. The booklet fully describes the method of using this waterproofing under varying conditions and gives illustrations of numerous instances where it has been employed with the utmost satisfaction. Copies of this catalogue will be sent postpaid upon receipt of name and address.

An Incandescent Lantern

THE National Stamping & Electric Works of 406 South Clinton Street, Chicago, U. S. A., manufacture a very extensive line of gasoline, kerosene and electric lighting, cooking and heating devices and appliances, catalogued in both Spanish and English. The illustration herewith shows a new type of incandescent lantern which they are offering for export. The lantern is 14 inches high and 6 inches in diameter at the widest point and weighs 3½ pounds, net. It has a capacity of one quart of either gasoline or kerosene, which is placed in the bowl of the lantern and fed to the burner by means of air pressure instead of a wick.

This lantern is wind and rain proof

It is claimed that this lantern will produce 200 candle-power of incandescent light when operated at full capacity. It is equipped with a vaporizer and makes its own gas, burning this gas inside of the mantle which is tied securely on to the burner. It is also equipped with an automatic cleaning device which prevents the mechanism from clogging and serves as a regulator if it is desired to turn the light low.

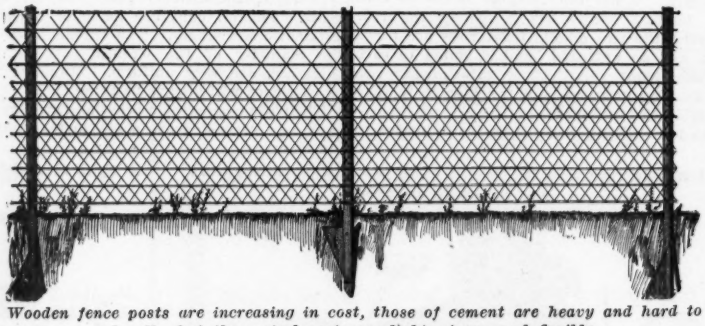
The lantern is complete in itself, is not any larger than the ordinary kerosene lantern, but produces twenty times as much light. Owing to the fact that a very large proportion of air is used in making the gas which this lantern burns, the manufacturers claim that it does not cost any more to operate it than the ordinary kerosene lantern.

The manufacturers claim that this lantern, which is known as the "Storm King," will operate from 15 to 20 hours on one filling and requires less attention or care than the ordinary lantern. They also state that it can be used just as roughly and will operate in any position; it can even be turned upside down or rolled on the floor while in operation without affecting the light in the least, and with absolutely no danger either to the lantern or anything surrounding it. This lantern is suitable for farmers, planters, railroadmen, dock lighting, street lighting and for parks and pavilions and by sportsmen, campers, street shows and circuses, also for contractors and all other outdoor night lighting purposes.

Anyone interested in the "Storm King" Lantern or any other of the 500 different styles of lamps, lighting appliances for kerosene, gasoline or electricity, produced by the manufacturers, can obtain full details on request. This concern desires agents in all countries where an agent has not already been appointed.

Superiority of Steel Fence Posts

PROGRESSIVE farmers always give close attention to the proper fencing of their property and are quick to adopt any new feature that possesses advantages in the way of strength, economy or durability. Wire fencing is now universally used, but there is much difference in opinion regarding the best material for posts. The advance in prices, within the past few years, of all kinds of lumber has caused a steadily increased demand for a strong, durable, low-priced substitute for wood. Cement was tried, but was found to be expensive, heavy to handle and liable to be damaged by marked changes in temperature. Finally, what is known as the Carbo Flexible Steel Fence Post was devised. It costs less than either wood or cement, is extremely easy to set up, and is remarkably durable, besides being proof against fire, lightning, changes in temperature, etc. This steel fence post is light in weight and is so strong and possesses such flexibility that it is not liable to be broken when subjected to sudden shocks. The low cost of maintenance is another desirable feature. Fields can be burned over without endangering the fences. Those who desire to know more about this solution of the fence post problem should write the manufacturers, the Carbo-Steel Post Company, Foreign Dept. A, 877 Rand-McNally Building, Chicago, Ill., U. S. A., for catalogues containing prices and other particulars.

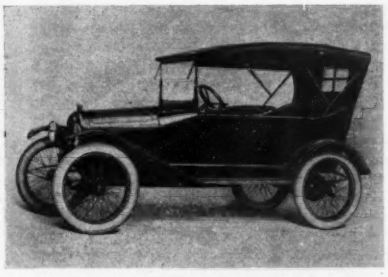


Wooden fence posts are increasing in cost, those of cement are heavy and hard to handle, but these steel posts are light, strong and flexible

A New Model Low-Priced Car

THE Metz Company, of Waltham, Mass., have just placed on the market a touring car model which is priced at so low a figure that almost anyone who wants a good automobile can afford one.

The manufacturers assert that this is first and last a quality car, built of the best materials from tires to top, and in its lines and general finish most attractive.

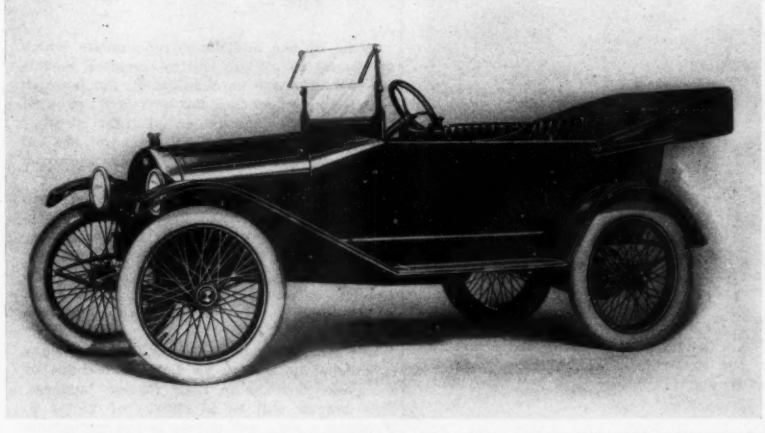


A Metz "25" touring model, showing the one-man top, windshield, etc.

The 105-inch wheel base affords ample leg room for both front and back seats, and the full elliptic springs are so adjusted as to make it especially easy riding. The seats are finished with tufted upholstery of best quality, with deep cushions, properly tilted to insure the greatest degree of comfort, and the car is fitted with robe rail and foot rest. The top is of the instant "one-man" type, and fits down over the wind shield frame, making a tight joint, so that when the side curtains are in place it becomes practically a weather-proof car.

This car is equipped with the Gray & Davis separate unit electric starter and lighting system, the searchlights being fitted with both large and small bulbs. Flush doors add to the attractiveness of the stream-line body, another feature of which is a tapering hood, with rounding top. Wire wheels, with 32 x 3½-inch Goodrich clincher tires further emphasize the up-to-dateness of this new model.

The plate glass rain-vision built-in wind shield is adjustable for ventilation, which insures safe and comfortable driving in any kind of weather, and the fibre grip gearless transmission entirely eliminates all gear and clutch trouble.



There is no suggestion of extravagance in the buying of this Metz "25" touring model at $600, fully equipped

The engine is a 25-horsepower water-cooled motor, with Bosch high tension magneto and A. W. T. carburetor. The cylinders are 3⅞-inch bore, with 4-inch stroke, and the valves, push rods and springs are completely enclosed. Other equipment includes a built-in gasoline gauge, speedometer, Hyatt roller bearings, signal horn, tire outfit, jack and tools complete.

In short, this new touring model embodies every improvement that has been found practicable, and at its price of $600, completely equipped, it meets the demand for a thoroughly reliable car that can be bought and operated on an economical basis.

This car travels five to fifty miles per hour on the high speed, and for reliable road performance it is said to have no superior in any class or at any price. It is a light car, of course, and for this reason its gasoline consumption is less and its tire mileage greater than the average.

The purchase of an automobile, and particularly a touring car, is an investment that pays dividends in enjoyment and health to the entire family; and while this is desirable, no matter what the cost, it must be admitted that the satisfaction of owning and driving a Metz touring car is all the keener because in the purchase and operation of it there is no suggestion of extravagance.

This car is fully described in catalogue "Y" issued by the Metz Company, which will be sent by them on request.

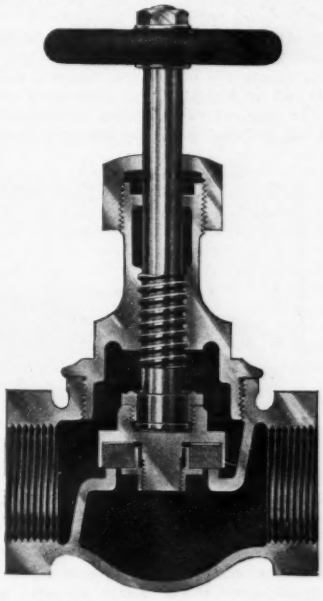
A New Steam Valve Disc

JENKINS BROS., who state that they were the originators of the renewable disc valve, have recently placed on the market a new composition disc for their steam valves, which they believe to be superior to anything of the kind they have heretofore made.

This new composition disc for steam service will be used henceforth in all Jenkins valves, which include their standard pattern globe, angle, cross and radiator valves, and will be known as Disc No. 119. The composition of which this disc is made is very hard, but becomes tough and flexible in service under steam pressure. It shows remarkable freedom from cracking and flaking, which is a characteristic of cheap composition discs, and has proved itself very durable in working steam pressures up to 150 pounds. During the past year the disc has been undergoing the severest tests in hundreds of plants and the makers have received many flattering testimonials from engineers who have been using it in their installations.

Jenkins Bros. new composition valve disc

A complete service department is maintained by this concern and is free to every purchaser of the Jenkins Bros. products. This department is organized especially with a view to assisting those who are in doubt as to the proper valve or disc to be used in a particular place.



A sectional view of a Jenkins Bros. brass globe valve of their standard pattern

Any user of steam machinery may obtain, without charge, a trial sample of this new No. 119 disc by addressing Jenkins Bros., 80 White Street, New York, U. S. A., and specifying the size desired.

A Waterproof Spar Varnish

THE Boston Varnish Co., makers of "Kyanize" finish, state that this product will satisfy the most exacting demands in salt or fresh water and will give equally good results on outside doors, window trims and porches. They claim that it will not turn white, crack or soften in salt or fresh water, or in heat, cold, sun or wind; in fact, it will give satisfactory results in any climate.

A novel can of triangular shape used for Kyanize Spar Finish

"Kyanize" Waterproof Spar Finish is being put in a novel can of triangular shape with a yellow lithographed label. The can is made as distinctive in appearance as possible so that if any consumer forgets the name "Kyanize" he will remember the triangular can with the yellow label.

Particulars regarding Kyanize Spar Finish can be obtained by writing to the Boston Varnish Co., Everett Station, Boston, Mass., U. S. A.

One Manufacturer's Five New Cars

THE most striking feature of the Overland exhibit at the recent New York Automobile Show was that each of the five cars shown exemplified in a marked degree the policy of the Willys-Overland Company of continually giving "more car for less money."

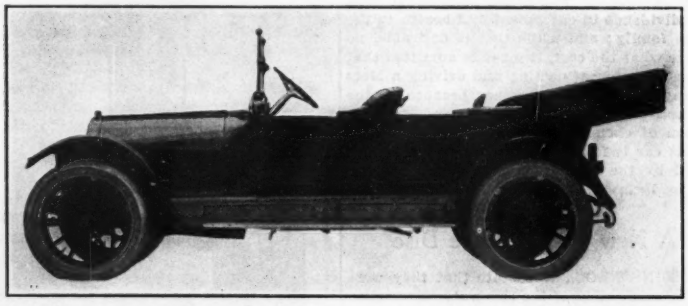
The Overlands, from the light four-cylinder Model 81 to the six-cylinder Model 82, are built throughout of the best material obtainable, all of which is first thoroughly tested in the physical and chemical laboratories of the big Toledo plant. The principle of quantity production on which the cars are manufactured enables the maker to give each operation the very best of technical skill and producing facilities. Each part is made by a specialist who is able to devote his entire attention to a single operation. This is one of the essential economic factors in Overland production.

Of the five cars shown, a touring car, four-passenger coupé and a roadster were of the four-cylinder, 35-horsepower Model 80. The others were a Model 81 four-cylinder touring car, and a Model 82 six-cylinder touring car. All were strictly standard in finish and equipment.

Among the many attractive features of all five models are especially noticeable the graceful body designs and the number of improvements which add materially to riding comfort and secure the maximum of quietness and flexibility of operation. All the bodies conform to the most modern ideas of streamline design without being exaggerated or freakish.

Full information regarding these cars may be obtained by addressing The Willys-Overland Co., Department 9, Toledo, Ohio, U. S. A.

On page 70 of this issue is another illustration showing a different view of the six-cylinder model 82. This is a seven-passenger car, of 45 horsepower, with a wheelbase of 125 inches.



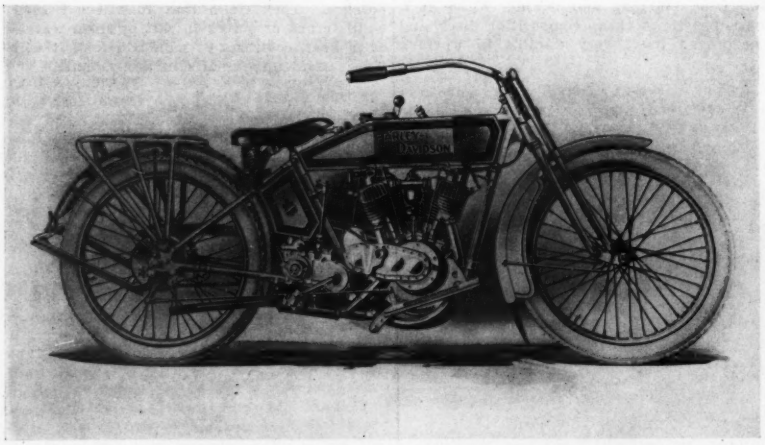
Gracefulness of body design and many new mechanical improvements add to the desirability of the new Overland Six, Model 82

An Improved Motorcycle

EACH year the Harley-Davidson Motor Co. have tried to improve their motorcycles and bring them to a higher stage of efficiency. As a result of fourteen years of steady development, with attention concentrated on a single type of motor, this concern offer a 1915 model for which they claim a high speed capacity and great flexibility.

The most important improvements in this new model are the three-speed sliding gear transmission and the patented Harley-Davidson step-starter. Besides these two features this concern have a long list of improvements and refinements which are found on all their 1915 models.

Just as the two-speed transmission has proved itself superior to a single geared machine for all-around work so the new Harley-Davidson three-speed twin, the manufacturers state, has demonstrated that it is more efficient, more convenient and far more economical than a two-speed or single geared twin could possibly be. With a two-speed twin in low gear the motor must be raced to negotiate roads that are too rough for high gear. There is no racing necessary, however, when a three-speed transmission is used, as the intermediate gear can be used in rough going, and no gear noise or over-heating of the motor results. This intermediate gear eases all the motor strains and provides just the proper ratio for hard traveling. In low gear the makers claim that this twin will go anywhere, having climbed a 45 per cent. grade with sidecar and passenger and a 60 per cent. grade with rider alone.



The new Harley-Davidson three-speed twin model 11-F needs no adjustments and the transmission is tamper and trouble proof

A person unfamiliar with the mechanism of a motorcycle can easily take care of this machine. The only care necessary is to maintain the proper oil level in the gear box. No adjustments are needed and the transmission is both tamper and trouble-proof. An ingenious looking device makes it impossible to shift the gears until the clutch is released, thus eliminating any chance of stripping gears.

Another important feature of this new Harley-Davidson motorcycle is the patented step-starter. This device is not an expensive extra, but is part of the regular equipment of each machine. It enables the rider to turn over the motor continuously without the use of a heavy, complicated mechanism liable to derangement. The usual way of starting a machine is to lift the rear end onto the stand attached to the rear axle and then pump. This is extremely awkward and almost impossible with a sidecar attached. With the new Harley-Davidson this clumsy operation is unnecessary. A forward down stroke on either pedal starts the motor. A back kick, which sometimes occurs when a beginner advances the magneto too far and opens the throttle too wide, automatically disengages the starter and eliminates possible injury to the starting mechanism.

Victor S. Welsford, Harley-Davidson dealer in South Africa, who is now manager of their new branch in London

Some of the additional refinements which are found on all the Harley-Davidson models are the automatic mechanical oil pump which can neither under-feed nor over-feed; exhaust valve springs enclosed in oil-tight sleeves; a new pressed steel muffler; larger tool box, oil tanks and supply pipes, and an improved double acting band brake.

In addition to the new three-speed twin this concern offer an 11-horsepower twin-cylinder single-geared model, a 6-horsepower single-cylinder two-speed model, a 6-horsepower single-cylinder single-geared model, an 11-horsepower twin-cylinder stripped stock model, and an adjustable tread gondola type sidecar.

The Harley-Davidson Motor Company have established a branch in London because of the great increase in their foreign business. This branch will be in charge of Victor S. Welsford, a man well known in the motorcycle trade. He was for some time the dealer for this concern in South Africa, where he met with marked success. All foreign business, except that from North and South America, will be handled through this London branch.

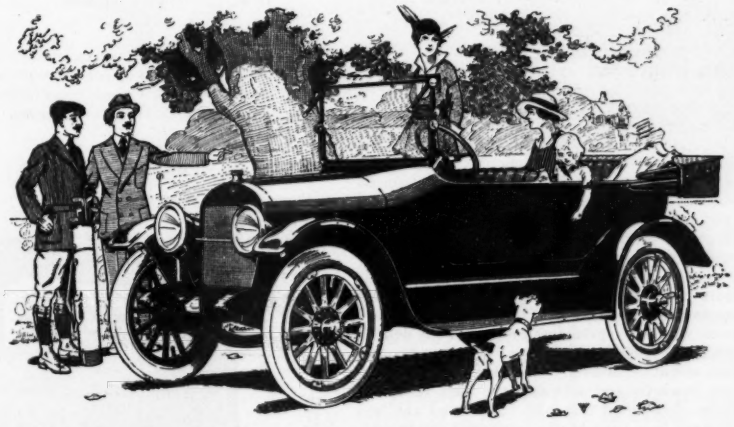
An illustrated catalogue giving a full description of their extensive line of motorcycles can be obtained by addressing the Harley-Davidson Motor Co., 52 E Street, Milwaukee, Wisconsin, U. S. A.

A New Eight-Cylinder Car

THE latest development in the American automobile industry has been the adoption of the eight-cylinder motor. The use of six-cylinder engines for automobiles is comparatively recent and seemed revolutionary to many motorists who were accustomed to the conventional "four." However, the advantages of the new motor were quickly realized and its use became very general. Shortly after the adoption of the six-cylinder engine comes the eight-cylinder. This type of motor has received a thorough try-out in Europe and has proved very satisfactory.

The King Motor Car Co. believe that this motor is to revolutionize American cars and they have placed on the market a new model which they style "the world's first popular-priced eight." The makers claim that the flexibility, freedom from vibration, power and economy of the "six" is far surpassed in the King Eight, and that it runs as smoothly and silently as an electric. The engine is extremely simple in mechanical construction. The cylinders are cast "V" type with the timer, carburetor and tire pump located between the cylinders. In a moment the valve guides may be located or any part of the motor reached with the same ease as in the vertical four. From the point of view of appearance and comfort this new King car is thoroughly up-to-date. The body has the latest streamline effect.

This concern believe that the dealer who is first in his territory to represent this car has a bright prospect. They are confident that an eight-cylinder car is the perfect type of automobile and that when it is offered at a popular price it should be especially attractive to buyers. Catalogues describing this car can be obtained from the King Motor Car Co., Export Department, 50 Union Square, New York, U. S. A.



This smooth-running, eight-cylinder King, at $1,350, is attracting the attention of many foreign automobile agents and dealers

Port Wine and Tonics

CONSTANTINO D'ALMEIDA, Oporto, Portugal, maker of port wine and Constantino Quina, an excellent tonic or appetizer, has issued a new catalogue in Portuguese which he is desirous of distributing among his customers and friends throughout South America. This book is fully illustrated and introduces a novel advertising idea. Photographs show the exterior of the factory, the packing and shipping departments where the bottled products are securely cased and made ready for export, the spacious wine cellars and the huge vats in which the wines are made. The greater part of this very interesting booklet, however, is taken up with views of the city of Oporto where the factories of this concern are located. The harbor and principal buildings of the city are shown, together with many other attractive illustrations which portray everyday life in Portugal.

The maker states that the consumption of his port wine and Constantino Quina has been considerably increased during the last few years. This is particularly true in regard to the export of the tonic to all tropical countries where fever is prevalent. The Constantino Quina is scientifically prepared from Peruvian bark and medicinal herbs and has proved very beneficial as a febrifuge. All persons desiring one of these catalogues should write to the address given above.

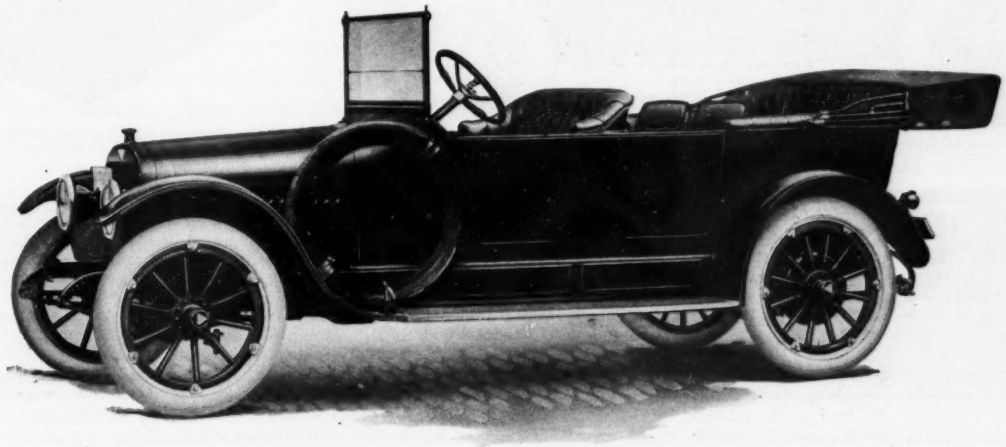
A Successful Light Six

IN view of last year's success the Hudson Motor Car Co. feel that their light six-cylinder cars have conclusively proved their merit and that they are the most successful of the many cars that this concern have manufactured. The most popular of the Hudson models is the Six-40. This car has proved especially attractive because a new type of motor—small bore and long stroke—has been installed in it. Many remarkable economy records have been made by this type of engine in Europe and the Hudson Company state that in countless competitions it ran more miles per gallon than any equal powered four that competed, thus giving to sixes, for the first time, a lower operative cost than fours.

The Hudson engineers have spent three years in perfecting this Six-40, and after a season of use in the hands of many Hudson owners they have made many additional refinements. The starting and lighting system has been simplified, the wiring improved and run through tubes, better carburetion has been attained and an automatic spark advance added. In thirty-one other ways the makers claim that they have improved this model, yet the price is less than that of last season. For this Six-40 chassis the makers furnish a variety of bodies which includes a phaeton, roadster, convertible roadster, coupé and limousine.

To satisfy the man who desires a more impressive car, larger and more powerful, the Hudson Motor Car Co. manufacture a Six-54. The lines and equipment of the two cars are almost identical, the main differences being the longer wheel base, the divided front seat and the larger engine of the "54" model.

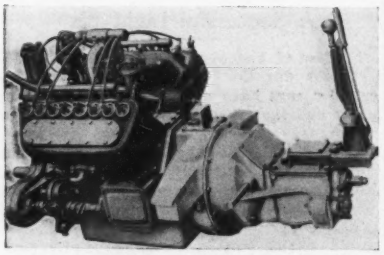
Special provision has been made by this concern to handle foreign business. Their export department is well organized and employs men who are familiar with the needs of the various countries in which cars are sold. Anyone desiring further information about the Hudson cars, or persons seeking trade connections, are invited to correspond with the Hudson Motor Car Co., Export Department, 7941 Jefferson Avenue, Detroit, Mich., U.S.A.



The Hudson "Light Six," with its small bore, long stroke motor, has made many remarkable economy records in America and Europe The 1915 model has many improvements over those of former years

A Low-Priced Eight-Cylinder Car

THE Briggs-Detroiter Co., Detroit, Michigan, U. S. A., have been experimenting with eight-cylinder cars for more than a year. The result is the new model "eight" which they have just placed on the market at $1,295. They have been investigating for several months the demand for such a car, and find that it is so general that it seems likely to exceed the supply. Therefore, they prepared their factory for a large production of these



The new "V" type of eight-cylinder motor is one of this year's big features

eight-cylinder machines, and began delivering them in quantities in January.

While following closely the stylish and distinctive lines of the 1915 Detroiter "four," the new "eight" is more elaborate in finish and appointments, and embodies many of the most advanced ideas of American motor car construction.

The cylinders are in two en bloc sets of four each, the cylinder dimensions being 2¾ x 4½ inches. The motor is rated at 34-horsepower at 1,800 revolutions. The two cylinder blocks bolt to an aluminum crank case, which has a removable bell flywheel housing. The crankshaft has two main bearings, front being 1⅝ x 2 3/32 inches, and rear being 1¾ x 4¼ inches. Both sets of connecting rods connect to this shaft, one throw bearing taking care of a pair of rod ends in opposite cylinders. In order to operate in the same bushing, one rod is yoked on the end, the other rod end fitting within this yoke.

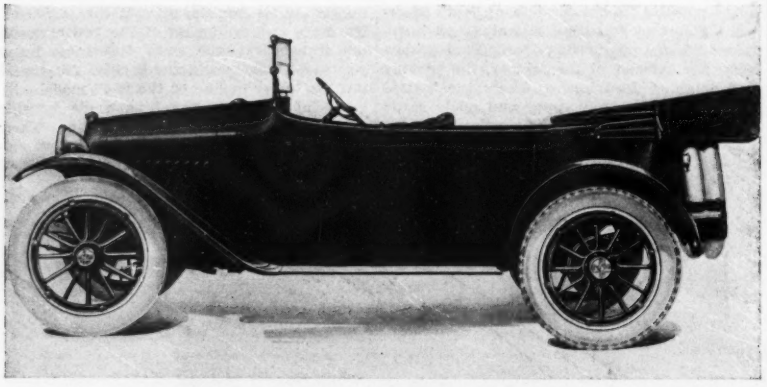
The single camshaft is directly above the crankshaft and has eight cams, one operating two opposite inlet valves or two exhaust valves, as the case may be. The cam assembly is on the under side of a plate which bolts to the top of the crankcase between the cylinders.

Positive lubrication is effected by means of a plunger pump giving an ample oil flow for all moving parts within.

The carburetor is the double jet type and is located between the cylinders. Starting, lighting and ignition are taken care of by a two-unit system with distribution coil and storage battery. The generator is driven from the front end of crankshaft by a silent chain and starting motor is attached to the front of bell housing, engaging with flywheel through inertia pinion drive.

Tests of the Detroiter "Eight" have shown a speed range of from 2½ to 56 miles per hour on high gear, and remarkable high gear pulling powers in heavy roads and on hills.

For further information regarding this new model motor car address Briggs-Detroiter Company, 5004 Holbrook Avenue, Detroit, Mich., U. S. A.

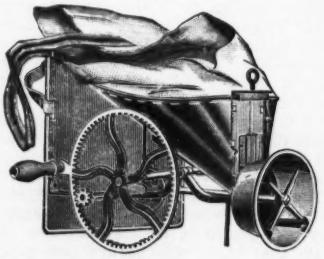


The Briggs-Detroiter eight-cylinder car, priced at $1,295, embodies many of the most advanced ideas of American automobile construction

An Improved Apple Barrel Press

AT the present time, when so much depends upon the careful packing of the fruit, apple growers will find of interest the improved barrel press shown in the accompanying illustration. Among the merits claimed for this press are the rapidity with which it operates and its extreme rigidity when once placed in position, the latter being especially important, because any movement, aside from a direct downward pressure, bruises the fruit and thus reduces its selling price. Apple growers who use the old style lever press will be surprised at the ease with which the improved press operates. The handwheel and screw, while very sensitive, are remarkably powerful and will hold the head securely while it is being fastened. The head can be released by a turn of the wrist and the barrel removed without changing the position of the arms. This allows another barrel to be placed in the press without loss of time, an important consideration when it is necessary to pack a large amount of fruit in a hurry. Particulars regarding this press may be obtained by writing to the Goodell Company, 109 Main Street, Antrim, N. H., U. S. A.

Another useful product which is manufactured by the Goodell Co. is an improved seed sower. No progressive farmer who aims to secure the best results from his labor will tolerate sowing by hand. Not only is hand sowing slow and tedious, but it requires a fair amount of skill, which can only be acquired after long practice, in order to avoid



The Cahoon sower insures an even and rapid distribution of seed

considerable waste. This concern claim that their improved Cahoon sower enables one man to do the work of five or six hand sowers and assures an even distribution of seed.

This improved apple barrel press has many points of superiority over the old-style lever machine

In addition to the apple barrel press and the improved seed sower, this firm make an extensive line of hardware specialties, including a variety of apple parers, corers and slicers; a new "Rapid" fruit slicer; a potato parer, and a "Victor" vegetable masher. The concern are also large manufacturers of table cutlery, kitchen and hunters' knives, etc. All of these articles are fully described and illustrated in catalogues and pamphlets which can be obtained by addressing the Goodell Company direct as above.

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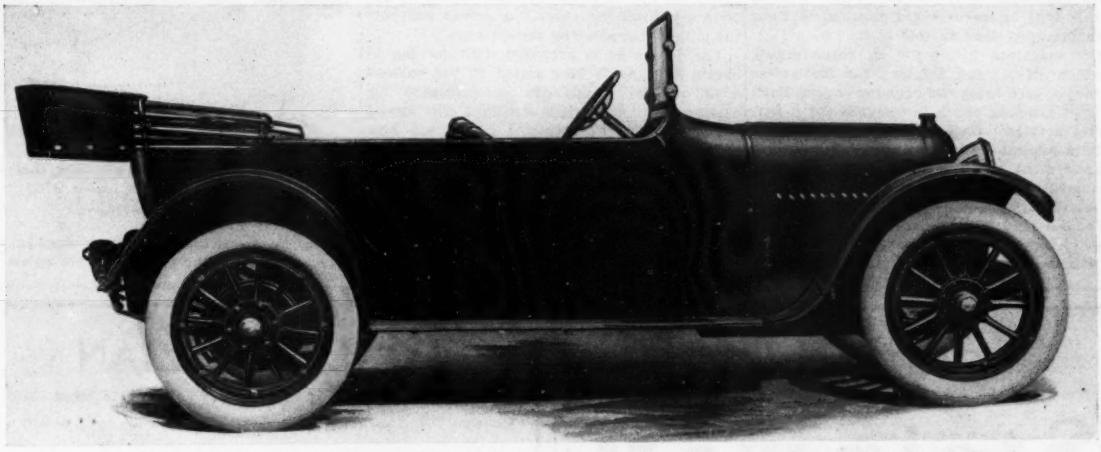
A Medium-Priced Car with Knight Motor

EVER since the Knight sleeve valve motor was introduced into the American market it has been confined to high-priced cars. This has been a disappointment to many buyers who were unable to afford the expensive models, although the superiority of this type of motor over the poppet valve type was generally acknowledged. Briefly, the great advantage of the sleeve valve motor is that its efficiency and durability are not affected by high pressures. The Moline Automobile Co. has placed a fair-priced Knight car on the market which should satisfy this demand for a sleeve valve motor at a moderate figure.

The motor specifications of this car are Knight sleeve valve type, four cylinders cast en bloc; bore, 4 inches; stroke, 6 inches; guaranteed 50-horsepower. It is said to be the only Knight engine with thermo-syphon cooling. Catalogues giving full descriptions of this car can be obtained by writing to the Moline Automobile Company, East Moline, Ill., U. S. A.



Moline-Knight touring car, five-passenger, 50-horsepower, 128-inch wheelbase, electrically equipped, at $2,500

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Improved Pipe Threading Machines

THE accompanying illustration shows one of the improved pipe threading machines made by Bignall & Keeler Machine Works, Edwardsville, Ill., U. S. A., who state that thirty years' experience in the designing and building of this type of machine has resulted in their becoming specialists in this line.

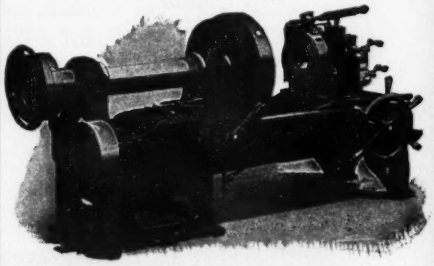
The machines are made in three styles, Peerless, PDQC and Duplex; the distinctive feature of each being the gripping chuck. Each style of gripping chuck is designed for a particular service. Each of the three styles is built in several sizes, and each has a capacity of from eight to ten sizes of pipe. In all of the machines the pipe revolves and the dies are stationary.

The die head is of the adjustable expanding type. After the thread has been cut the dies or chasers are withdrawn from the pipe, leaving the pipe free to be removed without backing out of the dies. The cutting-off device is on the back of the die head, where is also attached the reaming device for removing the burr from the inside of the pipe.

Each machine is provided with an oil pump for delivering oil to both the dies and the cutting-off tool. The bottom of the bed is raised at the forward end, thus draining the oil away from the chips. A screen prevents the chips from entering the oil pipe.

Each machine is arranged with gearing to obtain the speeds best suited to the various sizes of pipe. Dies can be furnished for cutting either the Briggs standard pipe thread or the Whitworth standard. Dies can also be furnished with the standard number of threads per inch for oil well tubing.

The machines are being used by plumbers, steam fitters, oil well companies, railroads, packing houses, power plants and many others. Machines have been shipped to England, France, Germany, Japan, Mexico, Australia, Philippine Islands, Cuba, Porto Rico, South America, Russia and Sweden.



An improved pipe-threading machine that has many special features and a wide variety of uses

A copy of complete catalogue can be obtained by writing the manufacturers as above.

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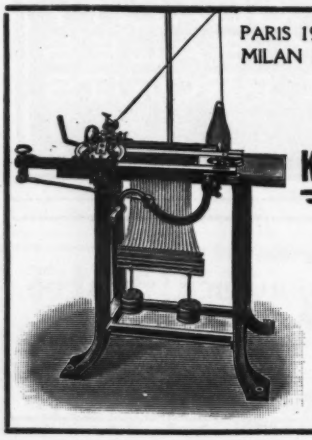

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